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THE AMERICAN
JOURNAL OF PHARMACY

MARCH, 1918

EDITORIAL.

THE DEBT OF AN ALUMNUS.

It is now generally conceded that our professional colleges and technical schools carry on their educational work at a cost that greatly exceeds any fees that it would be possible to charge their students. Comparatively few students seeking such education have unlimited means, and at this period of preparation for life's work, most of them are more or less dependent.

It is evident that the loss thus sustained by educational institutions in conducting their beneficent work, which is so essential to the vocations whose otherwise depleted ranks they are filling and, likewise, important as a factor contributing to our national progress, must somehow be provided for. Sooner or later, this problem becomes an imperative duty of the managers or trustees of each educational institution and some plan of sustenance has to be evolved suited to the peculiar needs and possibilities of the individual school.

In many states the professional colleges and technical schools are considered as proper objects for state aid and the legislatures apportion a percentage of the taxes collected toward the maintenance of these educational institutions. Such state aid is usually sufficient to at least compensate for the deficiency arising from the scant fees of students. Institutions of learning that are sustained either wholly or in part by state aid have the problem of financial management minimized.

With the development of the enormous resources of the United States and the phenomenal national prosperity ensuing therefrom there has coördinately developed a public-spirited benevolence among many of those who have been fortunate in accumulating an abun-

dance of wealth and it is a happy coincidence, auguring well for the future of the nation, that in increasing numbers these have endowed educational institutions.

However, there still remain a number of schools that are struggling to maintain a high standard in their work and to develop their possibilities without enjoying either state aid or the advantage of adequate endowment. That this handicap will become an insurmountable barrier to future progress and that it must be removed needs no argument. Possibly the most unique example of a school that has struggled against this illogical situation for nearly a century, and nevertheless has been foremost among the educators of pharmacists and chemists, is the Philadelphia College of Pharmacy which throughout this long period has relied upon its students and members for support. This handicap must be removed if this pioneer of pharmaceutical education in America is to fulfill its proper sphere of greater usefulness to pharmacy and to the country. We are pleased to report that the problem of an Endowment Fund for this school is receiving the earnest consideration of the officials and we are confident that the effort will receive the support of every alumnus and the aid of many friends of specialized higher education.

The graduate as he successfully completes his studies and receives his diploma is too highly elated, too fully imbued with the emotions and sentiments of the hour, to give serious consideration to his obligations to his alma mater. In after years, the alumnus has frequent occasion and ample opportunity to give consideration to his indebtedness. The difference between what it cost the college to educate him and the fees that he paid is but a small portion of his just obligation.

What alumnus can estimate the value of his collegiate preceptorship, or the influence of the moral and mental discipline instilled into his career along with the technical knowledge imparted? What has been the influence of these precepts in determining his business or professional success? Many of those who have been preëminently successful in the various branches of pharmacy have gratefully attested their indebtedness to the training of their alma mater.

The alumnus should be true to the teachings and precepts of his alma mater, and at all times loyal to her interests. The person who forgets this obligation or who speaks disparagingly of the very agency that has educated him and enabled his success shows evidence of moral and mental perversion.

The true alumnus always sustains his alma mater and takes pride in her achievements. He appreciates that he has inherited a share in her work and glory and, likewise, that he has a share of the responsibility for her future success. There is no better way for him to discharge his responsibility, to repay his moral indebtedness or to demonstrate his gratitude than to take an active interest in her welfare, to conscientiously assist in her problems and to contribute to her needs. The tributes of service and of financial aid can, at least, be a part payment of the debt that a loyal alumnus appreciates is due to his alma mater.

G. M. B.

PRICE MAINTENANCE.

The time-honored adage that "competition is the life of trade" has been so indented by questionable trade practices that its lines must soon be corrected by some qualifying term that will restrict as beneficial only such methods of competition as are fair to the consumer and salutary to trade. It is rapidly becoming more and more in evidence that tradesmen and the various trade interests are awakening to the fact that unrestricted price-cutting is a great economic evil that has sapped the strength and life of many legitimate and deserving enterprises.

The drug trade, especially, has been the goat of price-cutting. The popular proprietary medicines and toilet articles, constituting an important part of the druggist's stock, have been the favorite "eye catchers" in the advertisements of the department stores and the "cut rate" shops. The practice of advertising commonly well-known goods as "catch pennies" for the purpose of profiteering in other lines is too well known to need any comment.

As a rule, price-cutting and cut-rate advertising can be successful only where the capital of the advertiser and the volume of his business permits of an equalization of the total profits to the general average that is essential to the safe conduct of the business. How many of the smaller merchants, especially druggists, have followed this ignis-fatuus to bankruptcy when the same amount of energy expended along established ethical methods would have gained the confidence of the public and meant success! The demoralizing effect of such failures on all business makes it a public question of some moment. Moreover, where is the supposed advantage to the

consumer if, by these tricks of advertising, he is induced to pay twenty-five per cent. more for several articles because he has been offered one at half price?

The lawmakers of the nation and of a number of the states have been concerned with the framing and enactment of laws that would prevent combinations of capital in restraint of trade. The Sherman Act and the Clayton Act are the Federal Laws presumed to protect consumers from such combinations. We, likewise, have laws against unfair methods in business and the courts have frequently been called upon to determine and restrain unfair practices. There is a growing sentiment throughout the country that unrestricted price-cutting should also be classified as an unfair method of business.

In the case of the Great Atlantic and Pacific Tea Company vs. Cream of Wheat Company, the presiding judge, Hough, went somewhat further and expressed his opinion that price-cutting really restrains trade and lessens competition and that the maintenance of fair retail prices is in the interest of the buying public. Once this principle becomes established in our law, then we will have a basis on which we can found legal enactments that will control the evils resulting from unrestricted price-cutting.

In recent years, the authority of the federal government has been exercised in many ways to correct trade evils. The Food and Drugs Act, aimed to punish adulteration and misbranding in the trade of these essentials, was quickly followed by a pure paint act and a disinfectant act and other laws to compel truthful statements on labels and honest dealings. The demand for laws against fraudulent methods of advertising is another step toward uprightness in merchandising and the campaign of education for honest dealing and fair trade need not be very greatly extended to cover the evil of unscrupulous price-cutting. The problem now seems to center around the difficulty of so wording an act that a proper control of price can be maintained by a manufacturer without opening the door to combinations of capital in restraint of trade as forbidden by existing laws. This cannot be considered as an insurmountable barrier and it is quite probable that with further study one or more of the acts aiming at the price-cutting evil that have been submitted to Congress may be so amended as to permit of proper price maintenance without injury to the consumers and with needed relief to the merchants who are advocating fair and honest dealing in all trade methods.

The authority of the national government and of the state governments has been so repeatedly exercised in the fixing of rates for public services that the authority for such action is now no longer questioned. Even more frequently have the officers of the government, by arbitration or otherwise, determined wages and standardized prices for commodities. The laborer is worthy of his hire and should receive an equitable recompense for his service and the tradesman deserves the same fair treatment and should be guaranteed his overhead expenses and a just return on his capital invested and compensation for service rendered. As an essential element of society, the merchant expects due consideration of his necessities for the successful carrying on of his part of the nation's work.

A number of schemes aiming at price protection in the interest of the merchant alone, have been attempted from time to time. Most of these were only too apparent subterfuges to circumvent and defeat the purpose of the Sherman Act, and consequently these failed to withstand testing in the courts. It is becoming more and more apparent that such artifices are not the proper weapons and that the merchants who are seeking relief from the evils of unscrupulous price-cutting and its associated unconscionable profiteering must secure this by Congressional enactment of another "fair trade law" that will make it possible to control retail price-fixing so as to be beneficial to the tradesmen and work no injury to the consumers.

The suit instituted by the Attorney-General of the United States against Colgate and Company alleging violations of the Sherman law raises some new contentions and it becomes a grave question if the Department of Justice is not endeavoring to extend the provisions of this act beyond the intent of Congress in its enactment.

This well-known firm market an extensive line of products consisting of perfumes, soaps and toilet articles. For many years they have published a price list and in this appears opposite to each item the ***minimum price*** which they ask their customers to observe in the retailing of such article and the company reserves the right to accept direct orders only from those who do not sell these products below the minimum prices named. It is not alleged that Colgate and Company coerce dealers or prevent them from securing supplies of Colgate's products or of other goods elsewhere or that there is any combination with any other person or firm to control prices on similar lines of products.

The minimum prices named in the price list are as a rule below

the normal retail prices and so actually benefit the buying public while assuring to the dealer only a moderate profit which in some instances has been criticized as inadequate.

It would appear to us that there is here *no evidence of intent to restrain trade.* The effort of Colgate and Company appears to be to standardize, to stabilize prices in the interest of all concerned. The effect has been the very opposite of a restraint of trade. This plan has stimulated the interest of dealers and gained the confidence of the consumers and the actual result has doubtless been an increased consumption of the products of Colgate and Company. That such a plan, which is essentially a plan for "fair trade," working to the benefit of all the interests concerned, should be construed as a violation of any law enacted in the interest of fair trade appears to us as inconsistent and untenable.

G. M. B.

WAFER ASH BARK AS AN ADULTERANT FOR EUONYMUS.

By Heber W. Youngken, A.M., Ph.D.

Within the past few months the writer received four lots ot a bark purchased as and labelled "Wahoo Bark." Upon examination, one of these was found to be entirely wafer ash bark, while the other three contained varying proportions of wahoo (euonymus) and wafer ash. Just recently the writer has been apprised by a local wholesaler that something is wrong with his supply of euonymus. It is quite possible that the condition of euonymus on the market has been far from staple for some time. With this thought in mind and with the view toward aiding drug collectors and pharmacists in distinguishing between the genuine and spurious articles, the writer presents the important diagnostic characteristics of the plants and barks yielded by them.

Wafer ash bark is the bark of *Ptelea trifoliata* L., a small rutaceous tree attaining the height of from 20 to 25 feet with a straight trunk 6–12 inches in diameter, or a low-spreading shrub. It grows in rich moist soil from Lake Ontario to northern Florida and west to Minnesota and Colorado. Its branchlets bear alternate, rarely opposite trifoliate leaves, each of which consists of a fairly stout petiole 2½ to 3 inches long, bearing upon its extremly 3 subsessile,

ovate to oblong, serrate leaflets. The terminal leaflet is generally larger than the other two. The greenish-white flowers appear from March to June in terminal compound cymes and possess a rather disagreeable odor. The fruits are orbicular samaras ⅔ to ¾ of an inch in diameter, the wing portion of each being membranous, reticulate and emarginate. They ripen in the southern latitude in early summer but not until late in autumn in the northern states and persist on the long slender pedicels until the following spring.

Euonymus N. F., sometimes called wahoo or burning bush, is the dried bark of the root of *Euonymus atropurpureus* Jacquin, a shrub growing to the height of 6 to 10 feet or rarely (frequently west of the Mississippi) a slender tree 20 to 25 feet high, with a trunk 6–7 inches in diameter and covered with ash-gray fluted bark. It is found growing in rich soil generally along the edge of woods from Ontario to northern Florida and west to Montana, Arkansas and the Indian Territory. The branchlets (twigs) are obtusely 4-angled and bear simple, opposite, elliptical to ovate, acuminate, serrulate and membranous leaves, 2 to 5 inches long and 1 to 2 inches broad. The dark purple flowers appear on 7- to 15-flowered cymes from May until the middle of June. The fruit is a 3 to 4 deeply lobed capsule from ½ to ⅔ inch in diameter with light purple valves, which ripens in October, dehisces to expose its seeds, and remains on the cyme during the early winter months. The seeds are characterized by being covered with a thin scarlet aril.

Gross Structure of Wafer Ash Bark.—This bark appears on the market in the form of irregular transversely curved pieces or in quills of variable size and 3 to 4 Mm. thick. Its outer surface is light brown with prominent broad irregular transverse, grayish-white lenticels and transverse ridges. Its inner surface is brownish-yellow and smooth. Its fracture is short, the broken surfaces appearing waxy and pale yellow. The odor is faint and the taste bitter and acrid.

Gross Structure of Euonymus (Wahoo) Bark.—It occurs in transversely curved pieces or single quills of variable size and 1 to 2.5 Mm. thick. Its outer surface is graying to grayish-brown, irregularly furrowed and ridged and showing occasional transverse lenticels. Its inner surface is light brown or light buff. Its fracture is short exhibiting silky projecting caoutchouc threads in the inner phloëm region. Its odor is characteristic and its taste, bitter and acrid.

FIG. 1. *P*, Wafer ash bark; *E*, *Euonymus* N. F. (Photograph ¾ natural size.)

Histology of Wafer Ash Bark.—Under the microscope the following structural characteristics may be observed, passing from outer to inner surface:

1. Numerous layers of tangentially elongated cork cells, the walls of which are more or less lignified.

2. A cork cambium (phellogen) of delicate-walled cells, rich in protoplasm and exhibiting cross walls. Many of the cells of this region possess solitary rhombohedral crystals of calcium oxalate.

3. Several layers of stone cells forming a continuous sclerenchyme sheath.

4. A broad cortex zone consisting of tangentially elongated cortical parenchyme cells and intercellular-air-spaces. Some of the cortical parenchyme cells contain numerous spheroidal or ovate starch grains while others contain rosette aggregates of calcium

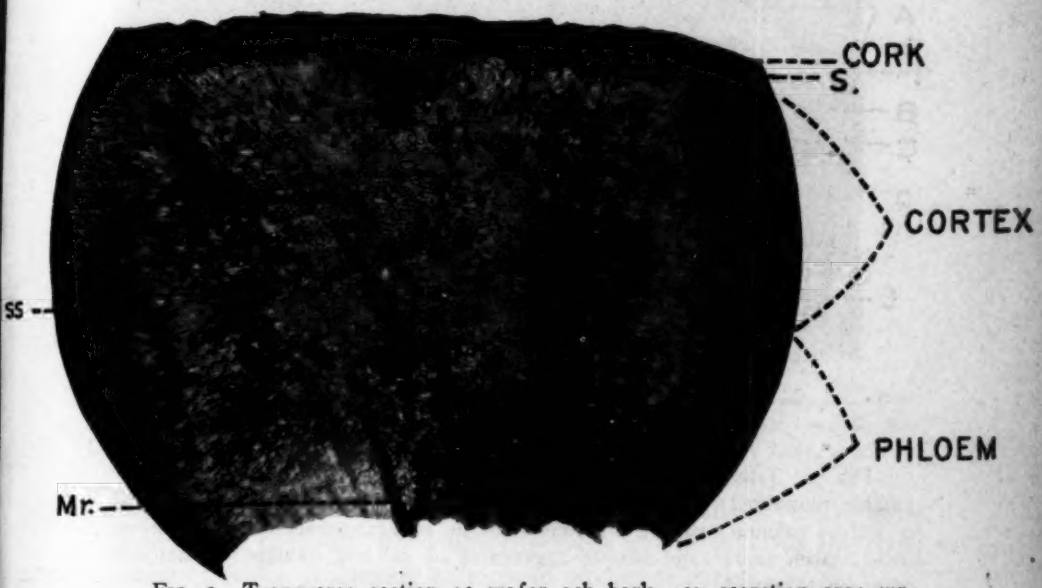

FIG. 2. Transverse section of wafer ash bark. *ss*, secretion sac; *mr*, medullary ray; *S*, region of stone cells and rhombohedral crystals shown enlarged in Fig. 3. (Microphotograph × 22.)

oxalate. The starch grains are simple or 2 to 4 compound. Scattered about in the cortical and outer phloëm regions will be seen sclerenchyme elements either isolated or in small groups.

5. A broad phloëm consisting of numerous phloëm patches separated from each other by wavy medullary rays which are 1 to 5 cells wide as seen in tangential section. Secretion sacs containing oil are found scattered in both cortex and phloëm. Some of the intercellular-air-spaces show rows of calcium oxalate crystals.

Histology of Euonymus.—Under the microscope, passing from outer to inner surface, this bark presents the following peculiarities:

1. An irregular cork zone showing lenticels and many layers of tangentially elongated cork cells whose walls may be either suberized or slightly lignified.

2. A cork cambium of meristematic cells.

3. A narrow cortex of cortical parenchyme cells, some of which contain more or less spheroidal starch grains while others contain rosette aggregates of calcium oxalate.

FIG. 3. Transverse section through outer portion of wafer ash bark (highly magnified). *A*, cork; *B*, cork cambium; *C*, solitary rhombohedral crystal of calcium oxalate; *D*, stone cells; *E*, cortical parenchyma containing small starch grains and rosette aggregates of calcium oxalate. (Photomicrograph × 200.)

4. A very broad phloëm, occupying most of the width of the section and consisting of cone-shaped phloëm masses (in cross section) traversed by wavy secondary medullar rays. Primary medullary rays separate the cone-shaped phloëm masses one from the other. These are one-cell wide in the inner phloëm but broaden out into fan-shaped wedges farther out. Some of the phloëm cells and medullary-ray cells contain starch grains while others possess rosette aggregates of calcium oxalate. Secretory cells containing a caoutchouc-like substance which dissolves in chloroform and carbon disulphide are found scattered about amidst other cells of the phloëm region.

After a close microscopical examination of a large number of transverse, radial-longitudinal and longitudinal-tangential sections of this bark, the writer has been unable to agree with the author of the N. F. IV description of the drug upon the presence of non-

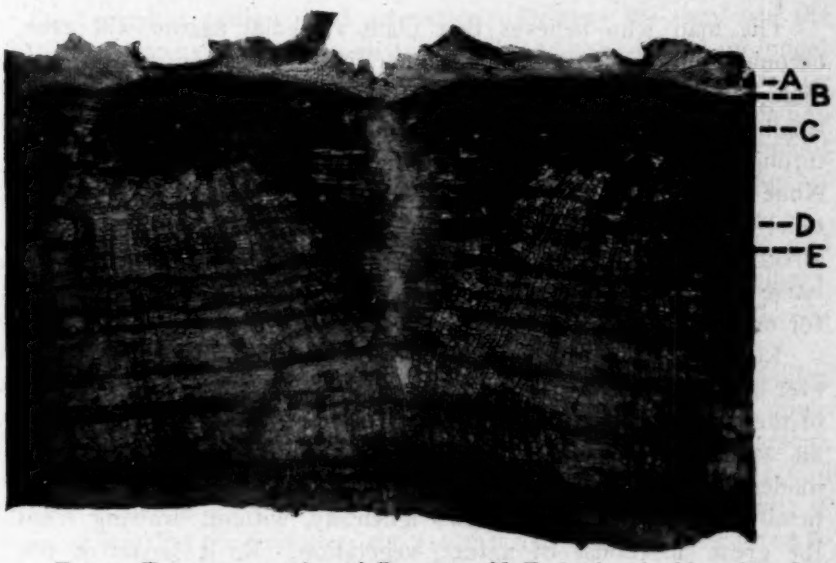

FIG. 4. Transverse section of *Euonymus* N. F. (wahoo bark). *A*, cork; *B*, cork cambium; *C*, cortex; *D*, portion of primary medullary ray; *E*, secondary medullary ray in phloëm patch. (Photomicrograph × 22.)

lignified bast fibers there mentioned. The "bast fibers" there indicated were probably wood fibers, present in the wood of the root, some of which frequently adheres to medicinal barks.

PHILADELPHIA COLLEGE OF PHARMACY,
PHARMACOGNOSY LABORATORY.

PLANT STRUCTURES AND CONNECTED PROBLEMS.

JOHN URI LLOYD, PHAR.M., CINCINNATI, OHIO.

The man who believes that plant remedial agents will ever become secondary in human or other life, is the man who, in the opinion of this writer, is either very one-sided in thought, or of small experience. Let us not underrate the value of all that comes through inventions due to human ingenuity, but let us not mistake. None of these inventions would have been possible but for vegetation—plant life. Let us fully credit whoever accomplishes in any direction where accomplishment has been made, whether in manipulative alterations or additions to life's opportunity, but let us not for one moment accept that man is independent of vegetation.

Listen! But for vegetation, neither man nor animal, of whatever kind, could ever have existed or had its being. From the germ of the spark of life to the fullest utilization of life's opportunities,—all, all comes from vegetation. No food that could for even a moderate length of time support a human being, could be made artificially by any method of man's ignenuity, without drawing from the great storehouse of nature, vegetation. Be it serum of the horse or juice of the turtle, be it vaccine of the cow or any product of animal economy, neither could be possible but for vegetation.

Listen! The muscle of the creature that is used as food, the fat of the creature that is used as food, the juice, the blood, the serums that are parts of food, are but materials transferred from vegetation to some new form, and when consumed as food by other animals, they become but another transformation in the life and substance that comes from the growing plant.

Not far distant is the flesh of the wild goose from the bacteria of the water that nourishes the vegetation that grows in the water, upon which the wild goose lives. The plankton jelly present in all water, and on which the small fish live, is not very far separated from the big fish that eats the small fish that has lived on the plankton, and when the human being enjoys the savory baked fish that lived on the small fish that lived on the plankton, he should credit this unseen plankton, that form of water vegetation, transparent as glass, ever-present in water, capable of being collected as a food by small fish and other water creatures.

Listen! Know you a beef or a sheep or an animal of any description, that could have been what it is but for the food it eats? Know you any creature that, either in the first or the last analysis, lives on aught but plant food? Destroy the grass of the field, and the fenced-in cattle die of starvation. Destroy the nuts and the buds and roots of the trees of the wood, and the squirrel no longer lives. He has starved to death. Destroy the creatures that live on the grass and the corn and the wheat and the rye, and the buds and the roots and the fruits of the trees and shrubs and plants, annuals and biennials, and humanity not only disappears, but it quickly disappears.

Destroy the plankton of the water in creek, river and lake, and the minnow dies. Destroy minnow life, and no big fish follows. Destroy thus the big fish from all the waters of the world, and human life in immense quantities will be sacrificed.

Then let those who propose to raise high the banner bespeaking man's independence of nature halt, and think as they might think. Let them credit the great I Am, under whatever name they worship, or whatever creed they believe it best for them to acknowledge, and give thanks to the great Creator of it all. Let one and all unite in accepting that the first step, the greatest gift that has been given to man or to any creature, whatever that creature may be, is the gift of vegetation.

Think not that such as this concerns not the pharmacist and the physician. As one who for many years has been delving in the helpless struggle to attempt to comprehend but a little of it all, as one who for more than half a century has been as

"An infant crying in the night,"

I speak. As one who sums up the substance of the lessons that have come in the passing decades, may I not ask, Is not the man in medicine as dependent on vegetation as is the man who lives on vegetation? Are not the most valuable of all the remedies that in therapeutic service have accomplished from the days of the dawn of history, been either vegetable remedies or the products and educts of vegetation?

Give to Mother Earth the credit of so-called inorganics, on which, perhaps, a carping critic might say vegetation depends for its very existence. But let us ask, "Before these so-called inorganics take their part in life's economy, comes not the vital touch, that

makes them a part of vegetation? Does a dead seed sprout, in the richest of soil? And in the life of the plant are not the assimilated earth structures each a part of the plant, no longer inorganic, but all organic?" So, may I not ask, does not even Mother Earth need the touch of the Great Creator, before whom all men must bow, before whom all that is, is comprehensible, though to the feebleness of the human mind, it remains recondite beyond expression?

Give to the waters of the ocean credit for the vapor that spreads the earth about, and, dropping from the clouds as rain, waters the earth, making possible the life of the growing plant. And yet, the vapor of the water of the ocean, that makes the rain, could not nourish the growing plant were the life spark absent, the vital touch that is not water and is not earth, but comes from out the gift of the great I Am.

Give to the sunbeam credit for all that comes in its ray of wealth. Mantling the earth, it liquefies ice and melts snow, penetrates the ground and inspires the growing bud of the seed, that, under its touch, springs into life and activity. It sucks from the water of the ocean the moisture necessary to the plant's creation and existence. Together, water, light and heat penetrate the earth where creeps the root, where lie the salts and minerals needed in the life of the coming plant. Grasping, in a manner incomprehensible to us, the invisible gases of the air and those locked in the water that nourishes the roots, they form the food needed by the growing plant.

Give credit to one and all of these, but after all this is done, do not fail to accept that behind it all, beyond it all, outside it all, immeasurably greater than it all, is the Creator of all, who makes possible all that lies in life's economy.

Let us now apply the foregoing to the thought in mind when began this dissertation. As a text, the writer had before him a sentence expressed by the talented Dr. Martin I. Fischer, than whom no man to the writer known, in pharmacological research concerning life tissues and structures, is more competent. He speaks by authority, from the scientific side of life. His thought chimes into that which came to this writer from decades of empirical struggles in the study of vegetable remedial agents. Close together do we find our final thought, as expressed by myself in the foregoing pages, and as voiced so beautifully by Dr. Fischer in a statement of fact presented in an address before the Cincinnati branch of the

American Pharmaceutical Association, October 17, 1916, from which we transcribe, as follows:

"Among the most valued medicaments are to be included compounds and remedies established one hundred or more years ago. That it is a mistake to abandon tried and unquestioned remedies in favor of modern innovations that are experimental, and too often inadequate. Let me counsel the return to professional favor certain neglected pharmaceutical compounds of the fathers, that need but be known to the physicians of today, to be valued above others, less serviceable and more expensive. Such a return to past pharmaceutical preparations would not disturb modern research, but would give to legitimate apothecaries the much-needed professional encouragement of prescribing physicians."

SOME NEW AND INTERESTING VEGETABLE FOODS AND FRUITS.

CHARLES H. LAWALL, PH.M.

REPORT OF A LECTURE DELIVERED AT THE WAGNER FREE INSTITUTE OF SCIENCE JANUARY 14, 1918, BEFORE THE PHILADELPHIA NATURAL HISTORY SOCIETY.

At this particular time in the world's history every land is trying to save the old foods and to develop new ones. We have food conservation and food conversation. Both are needed. A broad-minded attitude and willingness to try new foods is a necessary factor in development along this line.

It is not intended in this lecture to discuss the numberless varieties of manufactured foods which are constantly appearing upon the market in new forms and under strange names. Some of these are simply old friends with new faces and deserve no mention. We want now to consider briefly the list of vegetable foods which are new within the past twenty-five years.

The word "new" in this connection does not necessarily imply that they have been created or developed within that time, although that is true in several cases. It means that through more perfect and rapid methods of transportation and distribution, certain foods which have had but a limited local use may be made available throughout a much larger area. No detailed consideration of new varieties of old fruits and vegetables finds a place. The number of these is legion and is being continually augmented, but they do not belong in this summary.

Neither is it the purpose to consider foods which might be classed as freaks or which can be eaten only by certain peoples, such as the edible birds' nests of the orientals. The foods herein described have either been observed or purchased in the Philadelphia or New York markets or sent out by the United States Department of Agriculture, Bureau of Plant Industry, in the hope that interest in them might be developed and their use encouraged.

Accounts of many of these are scattered individually through popular and scientific literature within the past ten years, but I have seen no comprehensive survey of the entire list at any time. Personal trials have been made of a number of them, such as the avocado, artichoke, celeriac, chayote, dasheen, Chinese cabbage, etc.

The most potent influence in the breaking down of the sharply defined seasons, which formerly ruled the market for perishable foods, is the modern refrigerator car, which, with the increased speed of railroad transportation, brings sections of the country within a few hours of each other which were formerly days apart. The result is that not only have seasonal variations in food largely disappeared, for in the larger cities fresh vegetables and fruits are now usually obtainable throughout the entire year, but new varieties and species are brought to markets to which they were formerly strange.

Some of these food novelties are luxuries, pure and simple, being high in price and low in calorific value. Others need only a popular demand to bring them into competition with many other low-priced staple foods of high food value. There is stretching out an ever-widening vista of agricultural possibilities, limited only by the flexibility of custom and freedom from prejudice shown by the food-consuming public. That prejudice plays an important part has been frequently evidenced in the past when attempts have been made to introduce new foods. Dr. Johnson is reported to have expressed his contempt for oats, now widely used as human food, by saying "It is a grain fed to horses in England and to people in Scotland." The development and popularity of the tomato has occurred within the last century and I have known individuals who remembered when this widely used fruit was believed to be poisonous, and the plant was used for ornamental purposes. The cranberry has come into general favor to the extent necessitating cultivation to supply the demand, within the memory of the present generation.

Two of our greatest staples, the potato and the maize, were un-

known to the civilized world until after the discovery of America and then only in an imperfect and half wild form. The development of these to a point where they have become of enormous economic importance in many parts of the world makes us wonder at the possibilities for the future of some of our as yet undeveloped vegetable foods.

The names of many of the following foods cannot be found in present-day dictionaries or works of reference. They are examples of language in the making.

We shall begin with *alfalfa.* This is the Spanish name of the leguminous plant *Medicago sativa,* also known as lucerne; Spanish trefoil; French, Brazilian or Chilean clover; medic or purple medic. It has been largely grown as a forage crop and soil improver and has been suggested in the finely ground form, called alfalfa flour, for human food. Its high and complex protein content, together with the amount of mineral constituents and of crude fiber, make it available when mixed with wheat flour, for the preparation of griddle cakes, cake and even bread. The State College of Kansas has issued a bulletin upon the subject and articles have appeared in the *Forecast Magazine* for March, 1915, and the *National Food Magazine* for November, 1917. Alfalfa flour has also appeared upon the market in package form with recipes for its use.

As a factor in releasing wheat flour for export it may come to play an important part before the war is over, as the cost is low and the nutritive value high, although the high amount of crude fiber might make it irritating to some. The composition of alfalfa flour is as follows:

	Per Cent.
Fat	3.77
Protein	16.30
Carbohydrate	36.07
Crude Fiber	25.01
Ash	8.79

Alfalfa in the herb form has also been recommended for preparing an infusion to take the place of tea as a table beverage.

Artichoke.—Under this name two different foods are found in our market. One is the flower head of *Cynara Scolymus,* a plant of the aster family, which bears numerous fleshy, imbricated scales, which, with the large receptacle, constitute the edible portion of the plant. They have been known and used in Europe for centuries

but have only recently appeared in American markets. They are usually cooked by steaming and are served with a white, thick sauce of the Bearnaise type. The cost is high and the nutritive value low and they are classed among the luxuries. The composition is as follows: Water, 79.5 per cent.; protein, 2.6 per cent.; fat, 0.2 per cent.; carbohydrate, 16.7 per cent. (inulin); crude fiber, 0.8 per cent.; ash, 1.0 per cent.

The other artichoke, more commonly known as the Jerusalem artichoke, is the tuberous root of *Helianthus tuberosus*, a variety of sunflower. It is a native of America and was cultivated and used as a food by the aborigines. The name "Jerusalem" is not a geographical descriptive name, as might be supposed, but, curiously enough, is a corruption of the Italian "girasole," meaning "turning toward the sun" (sunflower). It is prepared by boiling or baking, as are potatoes, and is frequently seen in our markets in the fall. The composition is: Water, 79.7 per cent.; protein, 2.4 per cent.; fat, 0.2 per cent.; carbohydrate (inulin), 16.1 per cent.; crude fiber, 1.1 per cent.; ash, 1.0 per cent.

Avocado.—This is the fruit of *Persea Persea* (*Persea gratissima*), commonly known as the alligator pear. It is a tropical fruit, commonly found in northern markets, where it brings a high price. It sometimes reaches a weight of several pounds. Its high fat content gives to it, in the countries where it is grown, the names of "vegetable marrow" and "midshipman's butter." The composition of the edible portion, according to the U. S. Dept. of Agriculture, is as follows: Water, 81.1 per cent.; protein, 1.0 per cent.; fat, 10.2 per cent.; sugar, 6.8 per cent.; ash, 0.9 per cent. The high fat content gives it a fuel value of 512 calories to the pound. It is sometimes eaten as a melon, but is more frequently used in salads. The flesh of the ripe fruit is about the consistency of well-made butter.

Cabbage, Chinese.—Also known as Pe Tsai, Shantung cabbage and celery cabbage, *Brassica chinensis*. This novel variant of the cabbage family, of which there are more than seventy kinds, does not form a head like the common cabbage, but the leaves form tall celery-like stalks, more than a foot in length, blanched at the lower portion. It is frequently found in the Philadelphia markets and may be used raw, as a salad like lettuce, or cooked like ordinary cabbage. The large white midrib may also be cooked like asparagus. (See U. S. Dept. of Agriculture Bulletin No. 68.) The composition

is: Water, 96.50 per cent.; protein, 0.78 per cent.; fat, 0.10 per cent.; carbohydrate, 0.77 per cent.; crude fiber, 4.60 per cent.; ash, 0.65 per cent.

The Savoy cabbage, *Brassica bullata,* a variety of cabbage with crinkly, blistered looking leaves, is a very hardy type of cabbage often seen in the market stalls. The composition of this is about the same as ordinary cabbage.

Another cabbage-like vegetable of unidentifiable origin is sold in Chinese groceries, and consists of a cluster of stalks, white and succulent at the bottom and green and leafy at the top, and bears a raceme of yellow cruciferous flowers.

Cactus.—The edible fruit of many species of *Opuntia* have appeared in the market, usually under the name of Tuna Prickly Pear or Indian Fig. The strawberry pear, melon thistle and Mexican strawberry are fruits of other species of the cactus family, not so well known as the prickly pear. Prickly pears are found in various colors, as red, yellow and purple. They are pear-shaped or round and vary in weight from about an ounce to nearly a pound. The skin is usually tufted in spots with the spines which give the fruit its name. It is eaten raw, plain or in salads, in the form of preserves or sometimes pickled. A syrup made from the pulp is known as Tuna honey. The composition of the prickly pear is as follows: Water, 79.2 per cent.; protein, 1.4 per cent.; fat, 1.3 per cent.; sugars, 11.7 per cent.; crude fiber, 3.7 per cent.; ash, 2.7 per cent.

The fleshy leaves of the spineless variety of cactus, originated by Luther Burbank, is also of possible importance as a foodstuff. It can be grown without irrigation and the tremendous yield of 100 to 300 tons to the acre is sometimes obtained. It has been used successfully in feeding hogs and cattle, which are reported to thrive upon it. Its use as a human food is in its infancy. At a banquet in one of the western cities a few years ago, it was utilized in nine different ways.

Cardoon.—A plant of the thistle family, *Cynara cardunculus,* which, when full grown, attains a height of 8 or 10 feet. The young leaves and stalks, when banked with earth, like celery, become fleshy, crisp and tender. It is used in salads, soups and stews. It is quite popular in France, from whence it was formerly imported, although it is grown to some extent here. In Europe, the root, which is thick and fleshy and fine flavored, is used as a winter vegetable.

Celeriac.—Turnip-rooted Celery. The plant *Apium graveolens* var. *rapaceum,* is used both for its leafstalks, like celery, and its large roots, which are cooked and eaten like turnips or sliced raw and used in salads. This vegetable is frequently seen in Philadelphia markets during the fall and winter months. The composition of celeriac, according to the U. S. Dept. of Agriculture, is as follows: Water, 84.1 per cent.; protein, 1.5 per cent.; fat, 0.4 per cent.; carbohydrates, 13.2 per cent.; ash, 0.8 per cent. The fuel value is 285 calories per pound.

Chayote.—This vegetable, which is being introduced into northern markets by the U. S. Bureau of Plant Industry, a bulletin being issued on it, is the fruit of a cucurbitaceous plant, *Chayota edulis.* The fruit is pear-shaped, conspicuously furrowed, weighing from 4 to 8 ounces. It is somewhat prickly when fresh; the outer surface is green and shining, the inner portion white, and about of the consistency and insipidity of squash. It is called vegetable-pear in the British colonies. It is prepared by cooking like squash, and may be fried, creamed, stewed or made into salad or fritters. It is of low nutritive value and considerably higher in price than squash, with no advantage over the latter.

Chard.—The leafy tops of a variety of the common sugar beet (*Beta vulgaris*), grown only for its leaves and stalks. The leaves are prepared as greens, as the leaf midribs may be cooked and served like asparagus stalks. Swiss chard is the name applied to a variety with especially large leaves and midribs. The term chard is also applied to the blanched stalks of the artichoke, cardoon and several other plants. The composition is as follows: Water, 89.5 per cent.; protein, 2.2 per cent.; fat, 3.4 per cent.; carbohydrates, 3.2 per cent.; ash, 1.7 per cent.

Chicory.—The fresh root of "Succory" or chicory, *Cichorium Intybus,* is used as a vegetable, particularly by the Italians in our country and is sold in large quantities in New York City. It contains about 4 per cent. sugar, with little protein and fat. No starch is present, but instead there is found the carbohydrate principle inulin, which takes the place of starch in members of the composite family and which presumably possesses similar food value. The price of 10 cents a pound, at which fresh chicory root is sold, places it in the class of luxuries, for it possesses little fuel value. Its bitter taste makes it unpalatable to those who have not cultivated a liking for it.

Corn Flour, Maize Flour.—As a wheat sparer, one of the most valuable substances that has appeared recently upon the market, is finely ground flour made from maize or Indian corn. It has the following composition: Moisture, 7.9 per cent.; ash, 0.8 per cent.; fat, 4.85 per cent.; crude fiber, 0.45 per cent.; carbohydrates as starch, 77.6 per cent.; protein, 8.4 per cent.; foreign starches, none. It may be mixed with wheat flour to the extent of from 15 per cent. to 25 per cent., and bread, cakes and pies baked with this mixture are indistinguishable in taste and texture from those baked with wheat flour alone.

Cottonseed Flour.—Cottonseed oil (from *Gossypium herbaceum*) has been used as a food, either alone or in combination with other fats and oils, as in the compound and imitation lards. The press cake from the manufacture of the oil is a valuable foodstuff which has largely been used in cattle and stock feeding. It is recently being introduced as human food in package form, to be mixed with wheat flour in making bread, cakes, etc. The flour ground from whole cottonseed is also being introduced for the same purpose. It is very richer than the press cake and must be considerably diluted with wheat flour in baking and the shortening also omitted. Its composition is as follows: Water, 10 per cent.; protein, 19 per cent.; fat, 20 per cent.; carbohydrates, 24 per cent.; crude fiber, 22 per cent.; ash, 5 per cent. Its mineral and crude fiber content are also very high and are added reasons for its dilution with other flours in using. It is a low-priced, highly nutritious food, whose only disadvantage is the slightly disagreeable taste.

Dasheen.—This newly introduced tuber, in which the U. S. Bureau of Plant Industry (Bulletin 1110 and Yearbook of the U. S. Dept. of Agriculture, 1916) has taken such an interest, has been traced back originally to China, where it forms an important part of the staple food crop. It is the tuberous root of an aroid plant of the genus *Colocasia.* It has been cultivated for many years in tropical America and is known under the names "malanga," "eddo," "coco," "taya" and "taniei" (also spelled "tannia" and "tanyah"). It is closely allied to the Hawaiian Taro.

The plant looks like the caladium or elephant's ear. The corms or central tubers range in size from 1 to 5 pounds, and the smaller tubers which surround the corms in growing, weigh from 1 to 4 ounces. The yield from a single hill sometimes reaches 20 pounds. It is beginning to be raised as a regular crop in many parts of

the south and has been on sale in the northern markets for more than a year at a price not excessive, considering the high food value. Like other members of the arum family the tubers are very acrid in the fresh state and should not be tasted or eaten raw.

The food value is about 50 per cent. greater than that of the potato and the dasheen can be prepared and used in every way in which potatoes are used. It is mealy in texture and somewhat nutty in flavor. The U. S. Bureau of Plant Industry has issued several small leaflets giving recipes for methods of preparing this new and interesting food. Its subsequent development depends, of course, upon the popular demand. If this is created, the dasheen can doubtless be grown to market at about the same price as potatoes. Considering that it is a well-known staple in the West Indies, particularly in Trinidad and in some oriental countries, and that its nearest botanical relation in the vegetable foods, the taro, is the principal food of millions of natives of tropical and subtropical countries, the possibilities of the dasheen are very great. It sells at from 12 to 15 cents a pound in some of the larger groceries and in the Chinese quarter.

Egg Plant.—The fruit of *Solanum Melongena,* of which the purple, large-sized variety is best known, is also found in a smaller white or yellow variety about the size and shape of an egg, from whence probably the name originated. The names "brinjal" and "aubergine" are also applied to this fruit.

Fats and Oils.—Of the fats and oils, corn or maize oil, expressed from the germ of the maize kernel, and a by-product in the manufacture of corn products, is probably the most recent and is coming to be widely used in cooking for either deep fat frying or shortening.

The hydrogenated fats, those in which liquid vegetable oils are converted into solid fats by the use of nascent hydrogen in the presence of a catalytic agent, such as nickel, are also coming to be widely used. The oldest and best known of these is Crisco, which is a coined and trade-marked name.

A number of butter substitutes have recently appeared, in which cocoanut oil is the predominant fat instead of the mixture of beef and hog fats used as the basis of the older types of oleomargarine.

Feijoa.—Under this name has appeared in the Western markets a fruit, also known as the pineapple guava, which is described as possessing the refreshing taste of the pineapple, the richness of the

avocado, the pungency of the strawberry guava with a tang of sassafras. The fruit is green in color, oval in shape and about 2½ inches in length.

Figs.—The "Eleme" or layer figs are packed in the American form known as "pulled" figs or in the square, plumped-up form known as "Loucoum" figs. These are both well known and have been on the market for many years. The only comment that need be made concerning them is to condemn the practice followed by California fig packers, of sulphuring the figs to keep them light colored and enable them to be packed in a much more moist condition. For this reason the imported figs are much to be preferred when flavor and not appearance alone is the criterion of value.

There have appeared on the market in the larger cities, at certain seasons, fresh figs; also there is sold a form of loose, sun-dried figs, which are intended to be cooked as are most other sun-dried fruits. Figs possess a high nutritive value on account of their high sugar content. The fuel value is about 1,500 calories to the pound and the composition is as follows: Water, 18.8 per cent.; protein, 4.3 per cent.; fat, 0.3 per cent.; sugars, 68 per cent.; crude fiber, 6.2 per cent.; ash, 2.4 per cent.

Kale.—This cabbage-like vegetable, *Brassica oleracea,* is also known as borecole and winter greens. It does not form heads, but grows in open-leaved style and is cooked as "greens" like spinach. There are many varieties, differing in leaf texture, some plain, others wavy or curved and variously veined. It varies in color also, from green, through red and brown to purple. The composition is: Water, 82.9 per cent.; protein, 3.8 per cent.; fat, 0.9 per cent.; carbohydrates, 9.9 per cent.; crude fiber, 1.5 per cent.; ash, 0.65 per cent.

Kohl Rabi.—This is another of the many species of the cabbage family and is derived from *Brassica Caulo-rapa.* It is also known as turnip cabbage or cabbage turnip. The leaves are sometimes used as greens, but the fleshy portion, which is really a thickened stem and grows above the ground instead of in it like the turnip, is the real food part and is cooked and served like the turnip. The analysis, according to the U. S. Dept. of Agriculture, is as follows: Water, 91.1 per cent.; protein, 2.0 per cent.; fat, 0.1 per cent.; carbohydrates, 5.5 per cent.; ash, 1.3 per cent. It is a vegetable of rather low food value, yielding only 140 calories to the pound.

Kumquat.—This is a fruit of the citrus family (*Citrus Japonica*),

frequently seen in fruit stores. It is a dwarf orange, slightly smaller than a plum and of an elongated oval shape. It is eaten whole, skin and pulp, and is of an agreeably acid and aromatic taste. It is a native of China, but is now grown in many other countries. It is sometives served quartered or sliced in fruit and nut salads and is also made into marmalade and preserves. At state dinners in China the dwarfed individual trees are placed before the guests in order that they may pluck the fruit from the branches for themselves.

Lichi (or Litchi) Nuts.—This is a fruit (*Nephelium litchi*) grown in China and sold in a dried state in our country, usually in the Chinese quarters of our great cities. It is nearly round and a little over one inch across at its widest diameter, with a thin, papery, but tough shell, dark brown and reticulate externally, enclosing a dry, reddish-brown pulp, tasting somewhat like a raisin and containing a flat, stone-like seed. The composition of the edible portion, according to Atwater, is as follows: Water, 17.9 per cent.; protein, 2.9 per cent.; fat, 0.2 per cent.; sugar, 77.5 per cent.; ash, 1.2 per cent. The shell constitutes nearly one half of the weight of the nut as found in commerce. They are usually eaten as sold, but the Chinese infuse them with their tea, to which they communicate a characteristic flavor.

Loganberry.—This is a California product now grown in many parts of the East. It is a cross of the blackberry or dewberry and the raspberry, and is one of a number of such hybrids bearing such names as Lowberry, Laxtonberry, Phenomenal Berry, etc. The composition of the loganberry, according to a California Experiment Station Report (1895), is as follows: Water, 79.26 per cent.; citric acid, 1.52 per cent.; sugar (invert), 7.15 per cent.; protein, 4.55 per cent.; fat, 0.61 per cent.; crude fiber, 1.38 per cent.; ash, 0.57 per cent.

It is used in the fresh state and in the form of preserves and the expressed, unfermented and sterilized juice is coming to be widely sold as a substitute for grape juice as a beverage.

Loquat.—This is a yellow, oval, plum-like fruit of a Japanese tree, *Eriobotrya Japonica,* found frequently in American markets. It is also called "buroa," "lukwate," "pipa" and "Japanese medlar" or "Japan Plum." Its composition, according to the U. S. Dept. of Agriculture, is as follows: Water, 77.9 per cent.; protein, 0.2 per cent.; sugar, 20.2 per cent.; crude fiber, 0.6 per cent.; ash, 1.1 per cent. There are 395 calories in one pound of loquats. They

can be eaten in almost any manner, either raw or cooked. When eaten raw, the peach-like down should be removed.

Mango.—The fruit of *Mangifera Indica,* a native of Asia, extensively cultivated and much esteemed in tropical climates and known in hundreds of varieties. It is frequently seen in northern markets in fancy fruit stores. The fruit is of various shapes and colors and the size ranges from that of a plum up to several pounds in weight. The pulp has an agreeable acidity and an aromatic flavor. It is eaten raw, like a melon, or cooked in preserves, pies, tarts, etc. Its great juiciness makes it a difficult fruit to eat gracefully unless previously sliced or prepared. The pulp of the mango constitutes the basis of most of the various forms of chutney, particularly those of the East Indian type. The composition of the pulp, according to the U. S. Dept. of Agriculture, is as follows: Water, 87.4 per cent.; protein, 0.6 per cent.; fat, 0.4 per cent.; sugar, 9.9 per cent.; crude fiber, 1.2 per cent.; ash, 0.6 per cent. The calorific value is comparatively low, being only 220 calories to the pound. This fruit must not be confused with the mango pepper used as a condiment and for pickling.

Melons.—Quite a number of new varieties of melons, cucurbitaceous fruits, have found their way into our eastern markets during recent years. Melons have been cultivated in the Orient for several thousands of years and it is not surprising that new forms should begin to appear in the west. Among the more prominent of those which have been noted are the following: Casaba, Honey Dew, Californian, Candian, Egyptian (golden), French and Spanish.

Olive.—The ripe olive, the fruit of *Olea Europea,* is now quite common in our markets. The introduction of olive-tree culture into California is responsible for the appearance of the ripe fruit. It is a purplish black fruit, about the size of a small plum, with a soft, dark, oleaginous pulp of a bland flavor due to the presence of the olive oil. In the fresh state, this fruit possesses a bitter, disagreeable flavor which is removed by processing in alkali and subsequently washing in water or salt water. The cultivation of a taste for the ripe olives is even more necessary than in the more common pickled green olives. The ripe olives are found both in the canned form, packed in brine, and in the dried form. The composition of ripe olives, according to the U. S. Dept. of Agriculture, is as follows: Water, 67.0 per cent.; protein, 2.5 per cent.; fat, 17.1 per cent.; sugar, 5.7 per cent.; crude fiber, 3.3 per cent.; ash, 4.4

per cent. The fuel value is 407 calories to the pound, making them one of the most valuable of fruits from this standpoint.

Paradise Nut.—Sapucaia Nut. The seed of *Lecythis Zabucajo,* a large forest tree of the Amazon valley. The seeds are borne in a large urn-shaped shell commonly known as a monkey pot, similar to that in which the Brazil or cream nuts occur. The natural dehiscence of the fruit is accompanied by a loud report as the nut case drops from the tree, the neatly fitting lid being blown off by the gases developed during the ripening, and the nuts are scattered in the dense tropical undergrowth, which makes them expensive to collect. The individual nuts are about two inches long, pointed at the ends, slightly curved and grooved and of a light brown color.

Papaw, Pawpaw.—This is not the tropical, melon-like fruit of *Carica Papaya,* which has not yet found its way to the northern markets, but is the fruit of a tree indigenous to the middle West, *Asimina triloba.* It belongs to the custard apple family and is shaped like a short banana and contains a yellowish pulp which tastes, according to some observers, like an over-ripe muskmelon. It is preferably cooked, according to most authorities.

Poke.—The young shoots of *Phytolacca decandra* are frequently found in our Eastern markets in the spring, tied up in bunches like asparagus, and are cooked and eaten like that vegetable. The poisonous and acrid qualities noted in the mature plant are entirely lacking and the flavor is pleasant.

Rose Hips.—In the northwestern part of the United States, wild roses grow in such profusion that they are almost a nuisance. They thrive under adverse conditions and in some localities the fruits, which are round, fleshy and bright red and known as "hips," could be gathered by hundreds of pounds. They are not edible in the raw state but can be made into preserves and confections, and at present a large waste of a valuable food is annually taking place.

Salads and Greens.—Many new varieties of fresh vegetables are found in our markets which are used as salads or "greens." Cress, lettuce, endive, dandelion and pepper grass are common and older forms. Corn salad, *Valerianella olitoria,* is now seen frequently, as is also purslane, *Portulacca oleracea,* and the leaves of *Caltha palustris* are sometimes seen in the markets for this purpose. The green seeds of the nasturtium are pickled and used as a condiment, and the flowers themselves are used in salads.

Sapodilla.—This tropical drupaceous fruit from *Sapota Zapo-*

tilla, is occasionally seen in northern markets and is sometimes called the "dilly." It looks like a potato and a russet apple, but the flavor is said to combine the fragrance of the jasmine and the lily of the valley with the sweetness of honey. The composition of the pulp, as given by the U. S. Dept. of Agriculture, is as follows: Water, 77.9 per cent.; protein, 0.5 per cent.; fat, 1.6 per cent.; sugar, 16.6 per cent.; crude fiber, 2.8 per cent.; ash, 0.6 per cent. The food value is very high, as it contains 425 calories to the pound.

Soy Bean. Soja Bean.—This important, oriental legume, derived from *Glycine hispida* (*Dolichos soja*), is coming to be used as a forage crop and a land improver, and is slowly obtaining a place as a foodstuff of importance. It is peculiarly different from beans in that it contains much more protein and much less starch and contains a large amount of fat, which brings the calorific value up very high. The composition is as follows: Water, 8.25 per cent.; protein, 36.35 per cent.; fat, 17.22 per cent.; starch, 14.18 per cent.; crude fiber, calories per pound, 1970.

Its high fat and protein content make it peculiarly adaptable to the preparation of foods resembling those made from milk, and we find described, soy bean cheese and a kind of artificial milk, besides various meat substitutes as croquettes, etc. A preparation of the soy bean is the basis of the well-known Worcestershire and other similar sauces. Among the various oriental foods and drinks of importance prepared from soy are Tao-hu, a kind of bean cheese, which when pressed into cakes are called "Tafu." Other cheese-like variants of prepared soy are "Natto" and "Miso." Soy milk is known and the richer, creamy layer which rises is known as "Yuba." "Shoyu" is a sauce-like preparation made by partial fermentation of crooked and mashed soy mixed with water and other ingredients. The composition of soy makes it necessary to supplement it in the diet with some carbohydrate food such as rice, and the combination makes a perfectly balanced ration, fulfilling all nutritive requirements. The protein of soy is noteworthy in its greater digestibility than that of proteins from other legumes. Containing little starch, the soy beans and foods prepared from them are frequently recommended and sold for diabetic food.

Spinach.—There are several variants of this well-known vegetable, which is derived from *Spinacia oleracea,* which have appeared in recent years. There is a smooth-leaved variety and one which has smaller and prickly leaves. There is also a plant known as

New Zealand spinach from *Tetragonia Expansa,* which is sometimes grown and substituted for spinach as being more hardy than the latter.

Udo.—This new vegetable, which is coming into use, consists of the blanched young shoots of a member of the spikenard or ginseng family, *Aralia cordata.* It is tender and succulent and preferably used as a basis for salads.

QUARTERLY REVIEW ON THE ADVANCES IN PHARMACY.

By John K. Thum, Ph.M., Lankenau Hospital, Philadelphia.

It must be decidedly encouraging to physicians in this country to know that the manufacture and sale of the well-known drug "salvarsan" under the name arsphenamine is now permitted and has governmental sanction. The Federal Trade Commission has given orders for the licensing of three American firms to produce and sell this product. The Trade Commission's action was taken under Section 10 of the Trading With the Enemy Act under the direction of Commissioner Fort, on recommendation of Messrs. McDonald, Rogers and Phelps, who are in charge of granting such licenses. The medical profession also has cause for congratulation in that the U. S. Public Health Service will have supervision over the manufacture of arsphenamine, for which it has prepared rules and standards to which the manufacturers must conform. This authority has been given to the Public Health Service by the Secretary of the Treasury, and the strict observance of the rules and standards are a condition for obtaining such a license.

In a paper with the title "Simple Versus Combined Drugs," Van Leeuwen, of the Pharmacological Institute at Utrecht, enters protest against recent publications by Bürgi and others who make the assertion that the potential energy of certain drugs can be augmented by combining them. These premises are purely theoretical, he says, and have not been confirmed by practical experience. This seems to be a fling at the so-called synergistic action of drugs.

Cushny, in his "Pharmacology," speaks of this general belief by physicians in such action, but he asserts that as yet no satisfactory researches on this subject have been carried out to prove or disprove

this so-called synergistic action of drugs. It has been observed by many physicians that two or more purgatives prescribed together very often act more efficiently than one of them given in quantity equal to all of them. Cushny says it is impossible to explain this except by assuming that, although all are alike in their chief features, they differ in the details of their reactions, so that parts of the alimentary canal which might escape one are affected by another, and the mixture thus acts more universally than any one of the components.

It will be of interest to those in America who are acquainted with Prof. Henry George Greenish, of Great Britain, and his work in scientific pharmacy, to learn that he has been awarded the Hanbury Medal. To an American pharmacist mention of the words "Hanbury Medal" always brings to mind the first and only American pharmacist to have received this award, our dear and distinguished friend, the late Prof. John M. Maisch, the one-time professor of materia medica and botany in the Philadelphia College of Pharmacy.

The bestowal of this medal is undoubtedly the highest recognition that a pharmacist can receive for achievement in the domain of scientific pharmacy and, judging from a perusal of a brief biography of Prof. Greenish appearing in the *Pharmaceutical Journal* for October 6, 1917, the latest recipient of this signal honor is eminently worthy to take rank in pharmaceutical history with those eminent scientific men who preceded him in attaining this honor.

Anent the scarcity and high cost of glycerin and sugar the British Pharmacopœial Committee very sensibly reports that, in the national interest, the temporary withdrawal from the pharmacopœia of the official directions for the use of glycerin and sugar in the compounding of preparations is permitted. If the present conditions obtain for any length of time in this country, or get worse, which is more than likely, the revision committee of the United States Pharmacopœia should take similar action. The revision committee of the National Formulary should do likewise. The fact that the British government has specifically asked medical practitioners to refrain from prescribing these two substances is most impressive and should serve as a warning to us. The necessity for conservation is upon the whole world as never before.

The London Board of Trade has been instrumental in placing before Parliament for enactment into law a Patents and Designs Bill and a Trade-marks Bill, which seem to have been very carefully

drawn, and ought to be of service in reforming the patent and trade-mark laws, from the shortcomings of which the English pharmacist suffers in a like degree with his American brethren. As American pharmacists have been clamoring for years for patent-law reform and an amelioration of its hardships, sympathy and ardent hope for success will be felt for those on the other side of the ocean who are thus striving for better things. The Patents and Designs Bill has twenty-one clauses, and if honestly administered should be largely instrumental in "preventing the abuse of monopoly rights."

American pharmacists will find the following clause of interest and significant of conditions in our own country:

"In the case of inventions relating to articles or substances prepared or produced by chemical processes, or intended for food or for medicinal or surgical purposes, the specification shall not include claims for the product, substance, or article itself, but only for the special methods or processes of manufacture; and in the case of any patent for an invention intended for or capable of being used for the production of food or medicine or surgical appliances, the Comptroller shall, unless he sees good reason to the contrary, grant to any person applying for the same, a license limited to the use of the patented method or process for the purposes of the preparation or production of food, medicine, or surgical appliances, but not otherwise; and with a view to making the food, medicine, or surgical appliance available for the public at the lowest possible price, the Comptroller, in settling the terms of such a license, shall fix the royalty or other consideration payable at such an amount as will secure to the patentee the minimum profit consistent with his deriving a reasonable advantage from his patent rights.

"Any decision of the Comptroller under this section shall be subject to appeal to the court."

This clause should prevent extortionate prices for chemicals by those holding patent rights or registration of a trade-mark for an article manufactured from an expired patent.

There is every prospect that the scarcity of veronal and novocaine will, in the near future, be relieved. Three American firms have been granted licenses to manufacture and sell these important drugs. This right to manufacture products hitherto controlled by enemy aliens under American patents is granted by the Federal Trade Commission. One firm has been licensed to make and sell veronal under a non-exclusive name, and this name to be the word "barbital" It has also been decided that this new name together with the scientific name, diethylbarbituric acid, must be printed on all packages containing the drug. It has also been granted that the name veronal may be used on the package to aid in distinguishing the drug. One

of the requirements is that the firm manufacturing the drugs must pay to the alien firm holding the American patent five per cent. of its gross receipts on the sale of the drug. The Federal Trade Commission reserves to itself the right to fix the price of these drugs and to judge the quality of the drugs manufactured. All this is as it should be. And furthermore the Commission should see that the American public is not compelled to pay exorbitant prices for these really necessary and valuable drugs. Two other firms have been given the privilege to make novocaine, to which has been given the name procaine.

Drs. Schamberg, Kolmer, Raiziss, and Gavron embody in a paper appearing in the *Journal of the A. M. A.*, Jan. 19, their result of experimental studies of the mode of absorption of mercury when applied by inunction. How the mercury reaches the blood stream by inunction has been a much mooted question for many years. Welander, of Stockholm, after much clinical investigation, announced that the greater part of the mercury applied by inunction is volatilized and absorbed through the lungs. He received much support in his contention from other clinicians. As a result of his work he advised light smearing of the skin with mercurial ointment instead of vigorous rubbing in. He also advised inhalation cures, using bags containing mercury in powder form and worn around the neck at night.

In a rather novel manner the authors seem to have proved the dominant route of absorption when mercury is used on the skin.

They constructed a box to domicile two rabbits, one to be rubbed with mercury and the other to be made to breathe the mercury-containing atmosphere. The rabbit who had received inunctions had his head projected through the outside of the box, in such manner that it could do itself no harm. The other rabbit received no inunctions but was compelled to constantly breathe the mercury volatilizing from the other's skin. In order to facilitate absorption those rabbits who received inunctions had their hair removed with a depilatory, barium sulphid being used for this purpose.

The experimental studies were repeated five times, ten animals being used altogether. After giving in detail their work they give the following conclusions:

1. Animal experiments demonstrate that the chief avenue of absorption of mercury, when applied by inunction, is the skin.

2. Rabbits may be fatally poisoned with mercury by inunction, even when no opportunity of absorption through the lungs exists.

3. Rabbits breathing a mercury-laden atmosphere may absorb considerable quantities of mercury through the lungs, but, as a result of our experiments, we believe the respiratory absorption to be far less important than the cutaneous absorption.

4. Metallic mercury in the form of the official mercurial ointment is more volatile and is more apt to be absorbed by the lungs than calomel ointments of equal strength.

5. Calomel ointments are fully as well absorbed through the skin as the ordinary blue ointment; indeed, we have the impression that calomel is absorbed with greater facility.

6. There appears to be no reason why calomel inunctions should not supplant the unclean blue-ointment rubbings which have been so long in use.

One cannot help but remark the unfairness of the formulas allowed for medicating alcohol for sale direct to the public by the pharmacist. That there is a legitimate use for alcohol by the laity cannot be gainsaid. Many people are in the habit of using alcohol for rubbing and bathing purposes. Nothing is more grateful to the tired athlete than a brisk rub with alcohol. Many masseurs find it indispensable in their work.

Who can say with positiveness that alcohol containing one per cent. of phenol, or 1 part of formaldehyde in 250 parts of alcohol, is absolutely harmless? Who among us, knowing the possibilities of harm, would be willing to be rubbed or bathed with alcohol containing bichloride of mercury or lysol?

The regulations state that the containers of alcohol so medicated(?) should bear a "poison" label. So they should. That is just what such an alcohol would be. POISONOUS! No question about it.

It is unfair to the people to compel them to go to their physician and pay a fee for a prescription to get a harmless medicated alcohol. The added tax on alcohol makes its purchase onerous enough.

It is quite possible to make an undrinkable alcohol and yet at the same time usable externally as a liniment or for bathing purposes by permitting the addition to it of a small quantity of alum and camphor. Alcohol so treated cannot be recovered by distillation and the veriest toper would not be tempted to drink it. In Treasury Decision 1969, amending T. D. 1757, prescribing formulas for denaturing alcohol withdrawn for scientific purposes under section 3297, Revised Statutes for use in hospitals and sanitariums, there

are two formulas allowing simply alum and camphor in certain proportions. Either of these would answer every requirement for external use and could not be used internally. They are formula number one and number five and are as follows:

FORMULA NO. 1.

Alum	10 grains
Camphor	3 "
Alcohol	4 ounces

FORMULA NO. 5.

Alum	1 dram
Camphor	1 ounce
Alcohol	1 pint

Undoubtedly if the organized pharmaceutical bodies of the country present their side of the case, and point out the injustice to the laity of the present formulas, the Treasury officials will permit a greater latitude in the choice of recipes for denaturing or medicating alcohol.

DEVELOPMENT OF ORANGE-OIL INDUSTRY IN JAMAICA.[1]

The earthquake that in 1908 laid Messina in ruins and caused a setback to the Sicilian production of essential oils gave the first important impetus to the new orange-oil industry in Jamaica. Previous to that time Sicily had been the chief source of supply of the oils of orange and lemon, and until large stocks were lost during the earthquake there was practically no sale for West Indian orange oil. There is a difference in chemical constituents between the Jamaican and the standard Sicilian oil and buyers were not inclined to change and thus risk altering the flavor of their products. The adequacy of supply of the standard oil to which they were accustomed also militated against the Jamaican oils finding a market except at lower prices.

The prices of orange oil rose on account of restricted supplies and the prospects of reduced production, and the rise marked an opportunity for Jamaican oranges.

[1] Abstract from report of Charles L. Latham, consul, Kingston, Commerce Reports.

The principal use for which Jamaica orange oil is sold is in the manufacture of fancy biscuits, particularly of a wafer biscuit which is extensively used in the United States with ices and iced drinks. Sales of the Jamaica oil also are made to drug manufacturers.

The essential oil of orange is contained in the small cells that form the outer layer of an orange skin. It has simply to be drawn off by tapping the innumerable tiny oil cells and collecting and saving the volatile fluid. It must not be diluted with the orange juice, and must not be exposed for more than a brief time to the light and air. It should not be extracted with anything made of iron or steel, or the delicate product will be injured. It should be kept in air-tight and absolutely clean receptacles. It is rather liable to deterioration, and great care in handling is necessary.

The method that is practically the only one in vogue for the production of orange oil in Jamaica employs what is known locally as a "rinder," or escuelle, though the latter term really applies to a more elaborate machine, such as is used in Messina. The rinder is a shallow copper basin coated with tin on the inside and studded thickly with sharp copper tacks of about three quarters of an inch in length, pointing inward and upward. At the bottom of this vessel in an oil-collecting receptacle, which is shaped like the spout of a funnel, with the larger end opening into the basin and the small end closed. Some of the rinders are made locally and do not have a very finished appearance. The tendency has been to make the points too long, too sharp, and uneven. The rinder is held between the knees of the operator, who is seated, and with the open palm of the hand the orange is rolled lightly over the points of the tacks. These prick the cells of the rind, and the oil oozes out. The orange is ordinarily rolled until no more oil exudes. When the funnel is filled the oil is poured through a piece of cloth into an ordinary bottle which holds a quart or less.

At this stage of the process the oil frequently is found to contain some orange juice, and at times a mucilage. These foreign substances sometimes make it necessary that the oil be permitted to settle. Thereafter it is carefully drawn off and filtered. The rinding, though a simple operation, requires some care and skill. The length and evenness of the tacks in the rinder are important factors for the extraction of the oil without great waste. They should prick the orange skin only. If they are uneven, or too long

and sharp, either all of the orange oil will not be extracted without increased labor, or the orange juice will come through and make extra filtering necessary, with its attendant waste.

Several attempts have been made in the past to introduce machinery to supplant the simple rinder now in use. These have met with but little success. The rinding in Jamaica usually is done by women or children who work for small wages.

Very little oil can be taken from the skin of each orange, so that considerable labor is necessary to get even a pound, and the quantity of oranges consumed is very large. The trees are scattered, and the gatherers, principally girls and young boys, are sent out into the properties to gather the fruit and collect the oil on the spot. They soon become very expert. By this method they have only to carry the oil to the manufacturers, the fruit being left on the ground.

The picking is done in the early hours of the day; the rinding should be done immediately in order to get the greatest quantity of oil of the best color. The fruit should be picked when full, but not entirely ripe, as in the latter condition the oil has a deeper color and brings a lower price.

If the picking and rinding take place during the heat of the day the yield is smaller than when done at a lower temperature. The operator sometimes sits on a box, the rinder being attached to an arm extending in front. A good worker will get 2½ pounds of oil from 1,200 oranges.

By far the greater amount of orange oil produced in Jamaica is of the sweet variety. Bitter orange oil is produced in exactly the same way as the sweet oil, except that the bitter oil is obtained from the Seville or sour orange, and is not as valuable as the sweet oil. When the latter is being sold at $1.75 a pound, the producer of bitter oil counts himself fortunate if he succeeds in obtaining $1.25. The bitter oil is used also to flavor cakes and biscuits and, to a lesser degree, in the preparation of perfumes and essences.

NEED FOR PATENT-LAW REVISION. REPORT OF THE COMMITTEE ON PATENT-LAW REVISION OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION.[1]

At the present critical time when the efficiency of this nation must be raised to the highest point, it is essential that the United States government should lead in the efforts tending to such increased efficiency. To bring this about the government must protect and stimulate science, art and industry and at the same time curb or prevent waste of the country's resources. In this field the United States Patent Office has unlimited power for good and evil—good, in the issuance of patent grants for novel devices and substances which go to increase national efficiency; evil, in the granting of patent protection where such protection is not in the interest of national efficiency, conservation of energy and material resources.

For years the American Medical Association, in common with the national pharmaceutical bodies, has been urging the amendment of the law which governs the issuance of patents on medicinal preparations and more particularly revision of the procedure under which such patents are issued. At the Chicago (1908) meeting of the American Medical Association a special committee of five was appointed by the House of Delegates to study the questions involved, and to coöperate with the Association's committee on medical legislation in preparing and securing the enactment of a bill which would correct the abuses connected with the enforcement of our patent laws (*The Journal A. M. A.*, June 13, 1908, p. 2003). This committee presented a comprehensive report at the Atlantic City (1909) meeting of the American Medical Association (*The Journal A. M. A.*, June 19, 1909, p. 2063). A further report was presented at the St. Louis (1910) meeting of the American Medical Association (*The Journal A. M. A.*, June 18, 1910, p. 2079). In 1911 (*The Journal A. M. A.*, November 25, 1911, p. 1780) the Council on Pharmacy and Chemistry of the American Medical Association issued a report which set forth the inadequacy of our patent laws as they are administered in relation to medical products particularly.

[1] From the *Journal of the American Medical Association.*

Against Public Interest.—Since that time the Council has continued its study of the U. S. patent law as it applies to medicine and has become convinced that in many instances the patent law or its enforcement is contrary to the best interest of the public, both as concerns health and prosperity. The Council feels it a duty at this time to protest against the provisions of our patent law, or the methods of its enforcement, which permit the granting of patents without thorough and scientific investigation of the claims advanced in such letters patent. As one means of improving conditions the Council urges that the U. S. Public Health Service, the Bureau of Chemistry, U. S. Department of Agriculture and other scientific departments of the United States government conversant with medicines and related subjects be consulted before the issuance of patents on medicinal preparations.

In support of the Council's contention that the patent law procedure requires revision, the following is offered: In 1912 a U. S. Patent (No. 1,031,971) was granted on a cresol derivative, metacresyl acetate, a product described in chemical literature in 1903. When the Council inquired as to the grounds for the issuance of a patent for a substance known to science, the Patent Office replied that it was not familiar with the publication in which metacresyl acetate had been described. It seems evident that this patent would not have been issued had the application first been submitted to a government department familiar with chemical literature.

An illustration of the granting of a patent on the use of well-known chemical bodies which present no discovery or originality is the patent issued for the use of peroxids, perborates and percarbonates as ingredients of tooth powders (U. S. Patents Nos. 760,397 and 802,099). Regarding these patents *The Journal of the American Medical Association* (Sept. 20, 1913, p. 978) commented:

> The patents held by McKesson and Robbins give this firm the exclusive right of manufacturing tooth powders containing peroxids, perborates and percarbonates. It is another illustration of the unfair monopolies that may be secured under our present patent laws.

Granting a Patent to a Nostrum.—Again in 1913 U. S. Patent No. 1,081,069 was granted to a citizen of Switzerland (a country which does not grant patents on medicinal preparations) for a "composition which is intended to be used internally and which confers to the organisms immunity against the following microbial

infectious illnesses: *diphtheria, pneumonia, typhus, scarlet fever, influenza, septic infections, cerebral-spinal meningitis, syphilis, pest, cholera and tuberculosis; it is also effective in another kind of disease, viz., goiter.*" (Italics not in original.) The patent specifcation states that "the principal of these substances in creatinin . . . ," but offers no evidence whatever that this well-known chemical body has the extensive and miraculous powers claimed for it. In publishing a notice of this patent *The Journal of the American Medical Association* (Jan. 3, 1914, p. 54) explained:

"It appears that the inventor is dead, and that his estate took out the patent. Since this great benefactor should have been, by the use of his preparation, immune to practically all diseases, he must have died of senility, although this seems hardly to have been the case."

and held:

"Assuredly granting patents on such claims ought to be sufficient to show the need of a change in the methods of granting patents—at least of the methods governing the issuance of patents for medicinal products."

We submit that had the department of the government entrusted with the enforcement of the federal Food and Drugs Act been consulted as to the claims of this patent, it would probably have advised that, if the absurd and palpably fraudulent claims set forth in this application for a patant were made on the label of a prepartion of creatinin offered for sale in interstate commerce or in the District of Columbia, the vendor would be prosecuted.

In 1914 there was issued U. S. Patent No. 1,086,339. Here the "inventor" declared:

"It is the object of my invention to destroy parasitic microörganisms, particularly on living tissue without injuring the latter, by progressively evolving sodium hydroxid contiguous to said tissue, from and in a moist mixture of calcium hydroxid, sodium carbonate, aluminum sulphate and boric acid, . . ."

In a word, this patent apparently was granted for the production of sodium hydroxid by a chemical reaction which had been in use for several centuries. Because the patentee had twisted the granting of this patent into a quasi-endorsement of his nostrum, the Council's consideration of this preparation was sent the Patent Office as a protest against the present law, which authorizes the granting of patents on unproved and improbable medical claims. At that time the Council was informed by the Patent Office that reforms in the issuance of patents for medicinal substances had been instituted,

and that "the trouble will not be so pronounced in the future as it has been in the past."

Flavoring Epsom Salt a "Discovery."—There was issued early in 1917 U. S. Patent No. 1,212,888 for a method of flavoring Epsom salt—yet this "discovery" is a procedure which has been practiced ever since the cathartic action of this bitter salt has been known. Not only does the patent describe a process long known to physicians and pharmacists, but it sets forth claims that the flavored cathartic salt produced by the process cures flatulency, indigestion, sick and sour stomach, colic and destroys worms. In commenting on this patent *The Journal of the American Medical Association* (June 23, 1917, p. 1914) was constrained to remark:

> "The splendid conception of the framers of our constitution in providing a plan for promoting progress in science and useful arts by granting to inventors for a limited time the exclusive use of their inventions, in exchange for the publication of full knowledge thereof, is being debased. No branch of our government is of greater importance to the progress of the country than the patent office, provided that office is intelligently administered. When the patent office is used, however, for an extension of the nostrum business, founded on the abuse of patent and trade-mark laws, it becomes a menace to the public health. The objects of the patent law are being defeated by the practices of the patent office."

Still further, attention is called to U. S. Patent No. 1,226,394 for a process of making hexamethylenamin tetraiodide and on the product so produced. This patent was issued after the council had notified the Patent Office that hexamethylenamin tetraiodide had been discovered in 1888 and that a process identical in principle with that for which patent application appeared to have been made was published in 1916. On the basis of claims for which no evidence is produced this patent is issued for a well-known substance on the ground that as previously produced it contained a little free iodine or that the known processes were less economical. This patent appears to be an illustration of our patent procedure which obliged American users of acetylsalicylic acid to pay an exorbitant price because this country granted a patent which gave to the patentee, a foreigner, the exclusive right to the manufacture of the substance, whereas no such patent was issued in the patentee's own country, nor, as far as we can learn, in any other country. It forcibly illustrates the need for a revision either of our patent laws or of their methods of enforcement or both.

The Beveridge Patent.—In further justification of the Council's protest against the provisions of our present law, or the methods of its enforcement, which permit the granting of patents without thorough and scientific investigation of the claims advanced in such letters patent, the Council calls attention to the report, appearing above, of an investigation made by A. J. Carlson, A. E. Kanter and I. Tumpowski, "The Question of the Stability of Secretin," which relates to U. S. Patent No. 1,181,424, issued to James Wallace Beveridge.

Whereas the regulations governing the issuance of patents demand that the processes shall be described in such detail that one versed in the sciences can confirm the claims made by the patentee, no pretense whatever of fulfilling this requirement is made in the patent specifications of this patent. The substance of the first three paragraphs of this patent has long been general knowledge. Nearly every sophomore medical student has himself performed, or seen performed, such "experiments" as are therein described. The claims of novelty evidently are confined to the assertion that the preparation is able to "resist oxidation or deterioration"; that it is free from "poisonous and irritable chemical substances"; that it may be administered orally to produce the desired physiological action," etc. Not the slightest hint is given as to how any person can substantiate these claims. As a matter of fact, the investigation of Professor Carlson and his co-workers has shown that a preparation having the properties claimed cannot be made by the process described in this patent. Any one familiar with the subject could have demonstrated readily that the applicant was withholding information concerning essential features of his process, assuming that he had any information on the subject (which he probably did not have), and would have advised against the issuance of the Beveridge patent.

THE CHINESE MUSK INDUSTRY.[1]

Musk is one product of world commerce in which China practically enjoys a monopoly—not a large one, to be sure, since the annual output is at best only some $400,000 gold, but the product itself is worth many times its weight in silver, and for that matter, gold as well, in these days of high exchange.

[1] Extract from The Far Eastern Review for October, transmitted by Consul G. C. Hanson, Chungking.

About one half of the total output stays in China and is used especially by the Cantonese in compounding pills that form the best-known remedy in the Chinese pharmacopœia for Asiatic cholera. The Chinese also use musk to keep moths out of furs and clothing, and as a perfume, the odor being quite popular in the better grades of perfumery.

Practically all of China's musk comes from Tibet through the Szechwan frontier, the chief markets being Sungpan and Tachienlu, the former being by far the more important. Sometimes, when the road from Sungpan to Chengtu is unsafe, owing to brigands, part of the musk will be taken south and marketed in Tengyueh to go to India. This happened to a considerable part of the output in 1915, when 6,890 ounces out of a total of 25,367 were so shipped. The value of the 1915 musk crop was $266,000 gold. In 1916 some 25,160 ounces, valued at $407,000 gold, were shipped. Because of its commanding position in the perfume industry France has been the largest purchaser of China's musk, the United States being second; but in 1915 the United States forged ahead and bought more than a quarter of the entire output.

Good musk is bought for 10 times its weight in silver at Sungpan, and at Chungking for 18 to 25 times, so there is a heavy profit somewhere. Small supplies are brought out to various points along the Lungan road, where every coolie seems to have some about him, and the inns reek with the sickly smell. The musk is brought down in its pod, and the best kind is recognized by a nice brown color, and in its pure state by its overpowering stench; pods with grayish or dull-colored musk are rejected. It is retailed by one one-hundredth of an ounce, but it is adulterated more than any other article in the Chinese market.

By far the largest herds of musk deer are to be found on the southern shores of the Koko-Nor, and the supply of musk there (at T'aochou) is larger than the quantity that comes through Sungpan. In fact, great quantities of musk do not come to Sungpan at all, but are sent east to Yuchow, in Honan, where a fair is held in the ninth and tenth moons, many of the Sungpan traders visiting this place. At Tachienlu musk is the most valuable export, practically every hong reeking with it, and nearly all the Tibetans who come from the far interior bring some with them. The price of medium musk there is 13 times its weight in silver.

Musk is a secretion of the male musk deer. Three kinds of musk are distinguished in commerce, the most important and valuable being the Chinese or Tongkin musk, imported principally from Shanghai. It is put up in small tin-lined, silk-covered caddies, each containing from two to three dozen pods. These are generally adulterated with dried blood, fragments of leather, leaden pellets, peas, etc., so that often little more than the smell of the original tenant of the pod remains. The Chinese pods vary greatly in value according to quality and genuineness. Some musk collected from the western Himalaya is exported from India. It is much less prized than genuine Tongkin musk. The third variety, known as Kabardine, or Siberian musk, is exported from Central Asia by way of Russia. It is in large pods, said to be yielded by a distinct species of deer, and is very inferior in point of odor.

Good musk is of a dark purplish color, dry, smooth, and unctuous to the touch and bitter in taste. A grain of musk will distinctly scent millions of cubic feet of air without any appreciable loss of weight, and its scent is not only more penetrating but more persistent than that of any other known substance. As a material in perfumery it is of the first importance, its powerful and enduring odor giving strength and permanency to the vegetable essences, so that it is a principal ingredient in nearly all compounded perfumes.

Musk, or some substance possessed of the musk odor, is also contained in glands in the jaw of alligators and crocodiles, whence it has been extracted for use in perfumery in India and Egypt. The musk ox and the muskrat (Indian and European) are, as their names indicate, remarkable for a musk odor. The musk deer differs from the typical members of the deer family and stands by itself as an isolated zoölogical form, as both sexes are entirely devoid of any sort of frontal appendage and the upper canine teeth of the males are remarkably developed—long, slender, sharp-pointed, and gently curved, projecting downward out of the mouth with the ends turned somewhat backward. Among the anatomical peculiarities in which it differs from all true deer is the presence of a gall-bladder.

The musk deer has a wide distribution over the highlands of central and eastern Asia, including the greater part of southern Siberia, and extends to Kashmir on the southwest and Cochin China on the southeast, always, however, at great elevations—being rarely found in summer below 800 feet above the sea level, and ranging as

high as the limits of the thickets of birch, rhododendron, and juniper, among which it conceals itself in the daytime. It is a hardy, solitary and retiring animal, chiefly nocturnal in its habits, and almost always found alone, rarely in pairs, and never in herds. It is exceedingly active and sure-footed, having, perhaps, no equal in traversing rocks and precipitous ground; and it feeds on moss, grass, and leaves of the plants which grow on the mountains among which it makes its home.

Most of the animals of the group to which the musk deer belongs have some portion of the cutaneous surface peculiarly modified and provided with glands secreting some odorous and oleaginous substance specially characteristic of the species. The situation of the specially modified portion of skin is extremely various, sometimes between the toes, as in sheep, sometimes on the face in front of the eyes, as in many deer and antelopes. Sometimes it forms a distinct pouch or sac. This is the form taken by the special gland of the musk deer. It is found in the male only, and is a sac about the size of a small orange, situated beneath the skin of the abdomen. The secretion with which the sac is filled is of dark-brown or chocolate color, and when fresh is described as being of the consistency of "moist gingerbread," but becomes dry and granular after keeping. When the animal is killed, the whole gland, or "pod," is cut out and dried, and in this form reaches the market of the Western world, chiefly through China.

Owing to the great value of musk to the perfumer, the chemist early tried to solve the problem of making it artificially, and finally one Baur accidentally succeeded in imitating the odor in a compound made by linking the radicle of benzene and that of tertiary butyl alcohol. It is not a true musk, as the natural product belongs to quite a different class of chemical compounds. However, "Musc Baur," as it was called in the trade, enjoyed great popularity and sold for $20 gold a pound as far back as 1900, the product so sold being adulterated with 19 times its weight of acetanilid.

There are other artificial musks in the market now and the adulteration with inert chemicals has ceased. None of these, however, has the power that makes the product of Tibet so valuable, that of fixing the more fugitive floral odor and giving the resulting perfume lasting qualities that are lacking in cheaper grades, whose odor is sweet when moist but vanishes as the solution dries.

SELECTED FORMULAS OF THE MILITARY HOSPITALS FROM THE CHEMIST AND DRUGGIST DIARY.

Acriflavine Pastes.

Devised as a wound-dressing by Colonel C. J. Bond, F.R.C.S.

The suppurating wounds are packed with acriflavine paste after preliminary surgical sterilization and drainage.

The following are the different kinds of acriflavine paste:

1. Acriflavine soap paste is made by neutralizing stearic acid with sodium carbonate in the proportion of 1 part of sodium carbonate to 1¾ parts of stearic acid with the addition of 0.1 per cent. of acriflavine. The soapy compound so prepared is canary yellow in color and firm in consistence.

2. Acriflavine gelatin is made by heating French gelatin in water with the addition of acriflavine 0.1 per cent. The consistence of the jelly is determined by the amount of water added.

3. Acriflavine starch mucilage is made by adding boiling water to starch with the addition of 0.1 per cent. of acriflavine; 1 part of starch to 10 of water forms when cold a thick mucilage.

It is stated that the soap form (No. 1) is most used at present. —*British Medical Journal.*

Alderson's Glycerin and Ichthyol.

Used in place of boric fomentations.

Ichthyol	10 parts
Glycerin	90 parts

Ambrine Imitations.

Dr. Barthe de Sandfort, a French medical man, first devised a method of treating burns by coating the wounds with a film of paraffin wax. He employed "Ambrine," a preparation consisting chiefly of paraffin wax (m. p. 48.6° C.) with small amounts of fatty oil, an asphalt-like body, and coloring-matter. The melted wax is sprayed on the burn. The following formulæ have been published of imitations of ambrine:

"No. 7 Paraffin."

(Lieut.-Colonel A. J. Hull.)

Resorcin	1 part
Eucalyptus oil	2 parts
Olive oil	5 parts
Soft paraffin	25 parts
Hard paraffin	67 parts

"No. 7 Paraffin." Modified.

Beta-napthol	0.25 part
Eucalyptus oil	2.0 parts
Olive oil	5.0 parts
Soft paraffin	25.0 parts
Hard paraffin	67.75 parts

Russian Formula.

(Surgeon-General Eugene Hurd.)

Resin	1 part
Beeswax	1 part
Paraffin wax	4 parts

Melt in a dish set in boiling water for half an hour.

Asphalt-Paraffin No. 21.

(Leech's formula.)

Paraffin wax (m. p. 47.2°C. by U. S. P. method)	97.5 Grams
Asphalt	from 3 to 5 drops
Olive oil	1.5 Cc.

The asphalt is obtained by evaporating 10 Cc. of asphalt varnish on a steam-bath for half an hour. From three to five drops of the product is placed in a casserole with the olive oil, and stirred to effect complete solution. To this is then added, with stirring, the paraffin, previously melted.

Bismuth-and-Iodoform Paste.

"B.I.P.P."

Bismuth subnitrate	1 Oz.
Iodoform	2 Oz.

Liquid paraffin to make a thick paste.

Professor Rutherford Morison employs this as a packing for the cleansed wound, which is then covered with gauze and an antiseptic pad, kept in place with sticking plaster and a bandage.—*Lancet.*

Body-Vermin Killer.

Devised by Mr. Langford Moore, pharmacist at St. Bartholomew's Hospital, London.

Hydrarg. ammon.	ʒj
Zinci oxidi	ʒss
Magn. silicat.	ʒss

Ft. pulvis.

Apply to the infested area on a lint pad or by means of a pepper-box. The powder may also be used as a prophylactic dusted on the underclothing and the body.—*Lancet.*

Borsal.

Boric acid,
Salicylic acid ..... equal parts

As a first dressing was found by Sir W. Watson Cheyne "very efficacious against infections by bacilli of tetanus and gas gangrene." —*Lancet.*

Cresol Paste.

(Sir Wm. Watson Cheyne.)

Cresol 20 per cent. in a basis of lanoline and wax.
As a first dressing is placed on the wounds.—*Lancet.*

Crude-oil Ointment.

Devised by Mr. A. D. Peacock, M.Sc., for killing body vermin.

Crude tar oil	4 Oz.
Soft paraffin	2 Lb.

Mix.

Anoint the body from the neck to the knees and afterwards wash off.

Crude-oil Emulsion.

Professor Maxwell Lefroy's formula.

Whale-oil soap	10 Lb.
Crude Barbados petroleum	5½ pints
Naphthaline	4 Oz.

—*West Indian Bulletin.*

Lenthal Cheatle's Solution.

Used for sterilizing wounds.

A.

Mercury perchloride	1.0
Spirit (industrial), 80 per cent.	100 Cc.

B.

Malachite green, pure	1.0
Spirit (industrial), 80 per cent.	100 Cc.

For use mix equal parts of *A* and *B*. The liquid is sprayed on to the wounds.—*Lancet.*

Hydrion.

Wound antiseptic, devised by Dr. Thos. Lissaman, Bolton.

Mercury perchloride	4.375 grains
Calcium chloride	1.86 grains
Sodium chloride	34.76 grains
Potassium chloride	0.076 grain

Make into 40-grain tablets. One tablet is dissolved in a pint of water to make an antiseptic solution.

Madden's Balsam.

Used in the treatment of lacerated and dirty gunshot-wounds. The balsam is placed in the wounds after they have been cleansed with iodine or cyllin (1–2,000).

Eucalyptol,	
Guaiacol,	
Iodoform, of each	10 parts
Peru balsam	30 parts
Ether	100 parts

Mix.

—*Lancet,* 1916, I, 613.

N. C. I.

Vermicide devised by Mr. A. D. Peacock, M.Sc.

Naphthaline (crude)	96 parts
Creosote	2 parts
Iodoform	2 parts

The powder must not be used too freely as severe smarting may be caused. Dr. J. Parlane Kinloch finds that the iodoform in this

formula is useless; it is best to replace it with French chalk.—*British Medical Journal.*

Mastisol Wound Dressing.

I.

Mastic	20 Grams
Chloroform	50 Grams
Linseed oil	20 drops

II.

Resin	15 Grams
Sandarac	15 Grams
Benzol	70 Grams
Ethyl benzoate	5 Grams

III.

Nordmann's formula.

Mastic	20 Grams
Benzol	50 Grams
Linseed oil	20 drops
Resin	10 Grams
Venice turpentine	7 Grams

IV.

Van Itallie's formula.

Mastic	20 parts
Resin	20 parts
Castor oil	3 parts
Methyl salicylate	1 part
Benzol	56 parts

V.

Austrian Home Office formula.

Mastic	200 parts
Resin	100 parts
Venice turpentine	70 parts
Linseed oil	5 parts
Wintergreen oil	1 part
Benzol	500 parts

VI.

Max Page's formula.

Resin	50 Grams
Venice turpentine	5 Grams
Methylated spirit	50 Cc.
Benzine	25 Cc.

SELECTED PHARMACEUTICAL FORMULAS FROM THE CHEMIST'S CALENDAR.

Anti-Catarrh Smelling-Salts.

Phenol	Gr. xxx
Menthol	Gr. xxx
Ammon. carb. contus.	ʒiss
Pulv. carbonis ligni	ʒss
Liq. ammon. (0.880)	♏xx

Mix loosely. This may be filled into bottles or into tubes plugged at each end with cotton-wool.

Prophylactic Mouth-Wash.

Phenol	ʒss
Boracis	ʒj
Liq. formaldehyd.	♏xx
Sp. chlorof.	ʒij
Aq. menth. pip.	ʒiv
Aq. dest. ad	ʒvj

About a tablespoonful with a wineglass of water for use. Should be retained in the mouth an appreciable period to let it penetrate between the teeth.

Balsamic Mouth-Wash.

Myrrhæ	ʒj
Acid. benzoic.	Gr. x
Boracis	ʒiss
Tinct. krameriæ	ʒss
Aq. chlorof. ad	ʒviij

Triturate the myrrh with the borax and benzoic acid and a little of the chloroform-water, then add gradually the remainder of the water. May be used as it is or diluted to taste.

Petroleum Emulsion.

Paraff. liq.	ʒiv
Gum. acaciæ	ʒxiij
Tragacanth. pulv.	ʒj
Aq. dest. ad	ʒxij

Make a mucilage with 5 ounces of the water and the gums, then add to it gradually, with steady stirring, the liquid paraffin; when

the emulsion is established the remainder of the required water to be incorporated.

The dose is a teaspoonful to a tablespoonful.

For children this is an excellent preparation. It is mildly laxative and exercises an antiseptic influence on the intestinal tract, preventing, it is suggested, the formation and absorption of toxins.

When hypophosphites are desired in the emulsion they can be dissolved in a portion of the water and added before making up to measure. Sweetening and flavor are frequently added to the emulsion; on the whole, however, there is much to be said for the plain form.

Liniment for Rheumatism.

Menthol	℥ij
Chloroform	℥iv
Ol. terebinth.	℥j
Acid. acetic	℥j
Lin. camph. ad	℥iv

To be well rubbed over the seat of pain.

For Cracked Lips.

Menthol	Gr. ij
Zinc. oxid.	Gr. xxx
Adipis lanæ hydros.	℥iiss
Paraff. moll. alb.	℥ss
Hydrarg. bisulph.	Gr. ij

Mix intimately. To be packed into the cracks and renewed frequently. Promotes rapid healing.

A good lip-salve for ordinary use.

Benzoinated Cold-Cream.

Cetacei	℥j
Ceræ alb. ver.	℥ss
Ol. sesami	℥iv
Aq. rosæ	℥j
Tinct. benzoini simp.	℥j
Synthetic otto	♏x

Melt the spermaceti, wax, and sesame oil together with as little heat as will serve, beat in the rose water and tincture of benzoin, previously mixed, and finally introduce and mix intimately the otto.

An excellent application for the face to clean and soothe after exposure to the weather; it should be massaged over the skin, then wiped off with a soft cloth. In the morning only warm water should be used, no soap in washing, and the protective effect of the trace of cream remaining on the skin will be appreciated. This applies particularly to dry skins. The cream is a type of the preparation commonly described as "skin-foods."

Lotion for Spots on the Face.

Acid. salicylic.	Gr. xv
Zinci carb.	℥iss
Pulv. tragacanth. ver.	Gr. vj
Glycerin	℥j
Spirit. rect.	℥j
Aq. rosæ ad	℥ij

Mix the first two; make a mucilage with the spirit, tragacanth, and rose water, and add to it the glycerin. Then triturate the first two with a little of the mucilage and glycerin, and add gradually the remainder.

This should be smeared on at night and allowed to dry on; a little may be used in the morning.

Spots should be treated with an antiseptic to kill off the germs and prevent a new crop. The zinc soothes the concurrent inflammation, while the salicylic acid acts as the germicide.

Furniture-Oil.

Acid. acetic. dil.	℥xij
Ol. lini	Oiss
Sp. terebinth.	℥viij
Liq. antim. mur.	℥ij
Spirit. meth.	℥xvj

Shake well together. Industrial spirit to be used if permitted.

Furniture Cream.

Ceræ flav.	℥iss
Ceræ alb. ver.	℥ss
Saponis duri	℥ss
Ol. tereb.	Oss
Aq. dest.	Oss

By means of a water-bath dissolve the waxes in the turpentine

and the soap in the water; mix the two solutions and shake. A nice white cream of good pouring consistence.

Hair-lotion for Dandruff.

Resorcin	Gr. xl
Glycerin	ʒiss
Boracis cryst.	ʒj
Ess. lily of the valley	ʒss
Aq. dest. ad	ʒvj

To be sprinkled on the scalp and rubbed in night and morning for a few days, then once a day. A clean, effective lotion.

Lavender-Water.

Ol. lavand. ang.	ʒiss
Ol. lavand. exot.	ʒss
Ol. bergamot.	ʒss
Synthetic musk	Gr. ij
Civet	Gr. xx
Sp. rect.	Oiv
Aq. rosæ trip.	ʒiv

Makes a very good lavender-water. Improves by keeping for six months or so.

Rose Mouth-Wash.

Synthetic otto	♏xx
Synthetic musk	Gr. j
Ess. vanilla	♏x
Ess. jasmin	♏x
Sp. rect.	ʒiv

A few drops in a wineglassful of warm water to rinse the mouth.

Bath Crystals.

Sodii. carb.	1 Lb.
Synthetic otto	♏x
Ol. ylang-ylang	♏v
Synthetic bergamot	ʒss
Absolute alcohol	ʒij

Dissolve the oils in the alcohol and distribute evenly over the crystals.

This may be labelled "Cyprus Bath-crystals."

One or two ounces to a bath.

FOR SOFT CORNS.

Acid. tannic.	Gr. xl
Liq. formaldehyd.	♏v
Ol. amygdal. essent.	Gtt. j
Aq. ad	3ij

Dissolve the tannic acid in 3j of the water on a water-bath, transfer to a vial, add the formaldehyde solution, the essential oil of almonds, and sufficient additional water to produce 2 fl. dr.

To be applied on a pledget of cotton-wool so adjusted that it will remain in close contact with the corn. Renew night and morning.

Said to dry up the corn so that it can be picked out.

FOR HARD CORNS.

Acid. salicylic.	3j
Menthol	Gr. x
Collodii flex.	3vj
Ether. meth. (about 0.730 sp. gr.)	3ij

This may be tinted to fancy with a small quantity of an aniline color. Indian-hemp extract, which has been the conventional color hitherto, is now too expensive. The menthol has an anodyne effect which is appreciated.

TOILET-POWDER, PINK.

Acid. boric. pulv.	3j
Zinc oxid.	3ij
Pulv. talci	3ix
Boli armeniæ	q. s. (Gr. l–lx)

Perfume according to fancy.

It is well not to add much essential oil in case of interfering with the free dryness of the powder.

Synthetic otto	Gtt. x
Synthetic bergamot	Gtt. x
or	
Heliotropin	Gr. xv
Coumarin	Gr. v

serve admirably.

INTERNATIONAL ATOMIC WEIGHTS, 1918.

	Symbol.	Atomic Weight.
Aluminium	Al	27.1
Antimony	Sb	120.2
Argon	A	39.88
Arsenic	As	74.96
Barium	Ba	137.37
Bismuth	Bi	208.0
Boron	B	11.0
Bromine	Br	79.92
Cadmium	Cd	112.40
Cæsium	Cs	132.81
Calcium	Ca	40.07
Carbon	C	12.005
Cerium	Ce	140.25
Chlorine	Cl	35.46
Chromium	Cr	52.0
Cobalt	Co	58.97
Columbium	Cb	93.1
Copper	Cu	63.57
Dysprosium	Dy	162.5
Erbium	Er	167.7
Europium	Eu	152.0
Fluorine	F	19.0
Gadolinium	Gd	157.3
Gallium	Ga	69.9
Germanium	Ge	72.5
Glucinum	Gl	9.1
Gold	Au	197.2
Helium	He	4.00
Holmium	Ho	163.5
Hydrogen	H	1.008
Indium	In	114.8
Iodine	I	126.92
Iridium	Ir	193.1
Iron	Fe	55.84
Krypton	Kr	82.92
Lanthanum	La	139.0
Lead	Pb	207.20
Lithium	Li	6.94
Lutecium	Lu	175.0
Magnesium	Mg	24.32
Manganese	Mn	54.93
Mercury	Hg	200.6
Molybdenum	Mo	96.0
Neodymium	Nd	144.3
Neon	Ne	20.2
Nickel	Ni	58.68
Niton (radium emanation)	Nt	222.4
Nitrogen	N	14.01
Osmium	Os	190.9
Oxygen	O	16.00
Palladium	Pd	106.7
Phosphorus	P	31.04
Platinum	Pt	195.2
Potassium	K	39.10
Praseodymium	Pr	140.9
Radium	Ra	226.0
Rhodium	Rh	102.9
Rubidium	Rb	85.45
Ruthenium	Ru	101.7
Samarium	Sa	150.4
Scandium	Sc	44.1
Selenium	Se	79.2
Silicon	Si	28.3
Silver	Ag	107.88
Sodium	Na	23.00
Strontium	Sr	87.63
Sulphur	S	32.06
Tantalum	Ta	181.5
Tellurium	Te	127.5
Terbium	Tb	159.2
Thallium	Tl	204.0
Thorium	Th	232.4
Thulium	Tm	168.5
Tin	Sn	118.7
Titanium	Ti	48.1
Tungsten	W	184.0
Uranium	U	238.2
Vanadium	V	51.0
Xenon	Xe	130.2
Ytterbium (Neoytterbium)	Yb	173.5
Yttrium	Yt	88.7
Zinc	Zn	65.37
Zirconium	Zr	90.6

THE DEBT OF MEDICINE TO THE DISCOVERY OF DYES.[1]

The *Lancet* of July 17, 1917, calls attention to a series of articles on "Science and Industry," published in a supplement to a recent issue of the *Manchester Guardian*. There is one by Dr. C. W. Saleeby on "Dyestuffs and Medicine," in which the remarkable influence on the progress of medical science, encouraged by the discovery of coal-tar dyes, is discussed. The subject is not in the least new to medical science and scientific audiences, but is none the less interesting. As we have often pointed out, the selective action of dyes on microörganisms was a step of the utmost diagnostic value by adding to the efficiency of microscopic examinations, and now we are turning this selective action to account in the treatment of numerous infections. The dyes, in short, have laid the foundations of a system of chemicotherapeutics which promises to be of distinct importance in combating some of the worst of human ills. The discovery of a dye substance—*e. g.*, such as acriflavine—which appears to discriminate between friend and foe, only attacking the latter, suggests the possibility of finding further selective substances which are not inimical to the human organism, but destructive to the particular disease organisms which are known to have invaded the host. The possibility of successful treatment on these lines is real. Little could William Murdoch have conceived in 1792 when he distilled coal for the first time for producing gas for lighting his house —thus laying the foundations of the coal-gas industry—what great potentialities lay hidden in the distillation whose by-products now yield such an astonishing stock of valuable synthetics, antiseptics, dyes, and explosives.

CURRENT LITERATURE.

SCIENTIFIC AND TECHNICAL ABSTRACTS.

THE UTILIZATION OF THE ADSORPTIVE POWER OF FULLER'S EARTH FOR CHEMICAL SEPARATIONS.—In a contribution from the hygienic laboratory, U. S. Public Health Service, Atherton Seidell makes a further contribution to our knowledge of the value of fuller's earth for chemical separations (other than decolorizations).

[1] From *The Therapeutic Gazette.*

The use of this earth for the isolation of alkaloids from plant extracts and for the separation of "vitamines" has already been reported and has claimed the attention of several investigators.

The present communication deals with the relative adsorptive power of various fuller's earths, the effect of time on the rate of adsorption, etc. Experiments with solutions of methylene blue and of quinine bisulphate show that only the free base is adsorbed when these solutions are placed in contact with fuller's earth and that when both of these chemicals are present in the solution there is a simultaneous adsorption. Experiments were also carried on to determine the effect of ethyl alcohol and of cane sugar on such adsorptive.

The following is the summary of the conclusions:

A comparison of the adsorptive capacities of 36 samples of fuller's earths and other clays showed that English earth is superior to any of the domestic fuller's earths except one, the exact source of which could not be learned. Domestic bentonite exhibits a higher adsorptive power than the English samples of fuller's earth, but on account of its exceptional capacity for retaining water, it cannot be used to advantage in cases, such as the present, where a sharp separation of solid and solution is essential.

It was found that the adsorption of quinine bisulphate and methylene blue by fuller's earth increased with time of contact but at a gradually diminishing rate. It was also found that the amounts adsorbed continued to increase with amount of excess present. Maxima were not observed in the case of either the time factor or the concentration factor.

In the case of both quinine bisulphate and of methylene blue the free base only is adsorbed from the aqueous solution when brought in contact with fuller's earth. The acid component of each compound unites with calcium derived from the fuller's earth and remains in the aqueous solution.

When equal amounts of quinine bisulphate and methylene blue are simultaneously present in an aqueous solution shaken with fuller's earth, both compounds are adsorbed to approximately the same extent. The sum of the two components is about 25 per cent. greater than the amount of either adsorbed separately.

When the same portion of fuller's earth is first shaken with methylene blue and then with quinine bisulphate, a small amount of the latter compound is taken up and only a trace of the former

liberated. When the procedure is reversed, considerably more methylene blue is adsorbed and a fairly large proportion of quinine bisulphate is displaced from its combination with the fuller's earth. The results show that under the special conditions of this experiment fuller's earth exhibits a distinct preference for methylene blue.

Dilution of the aqueous solution, in the case of quinine bisulphate, does not diminish appreciably the amount adsorbed when the ratio of earth to alkaloid is approximately that required for complete adsorption. In the case of a ratio of earth which is insufficient for complete adsorption, dilution causes a distinct reduction in the amount adsorbed.

Increase of acidity of the aqueous solution, likewise, does not diminish the amount of quinine adsorbed in case the ratio of earth is just sufficient for complete adsorption. With less earth than sufficient for complete adsorption a distinct reduction in the amount of adsorbed alkaloid follows an increase in acidity of the aqueous medium.

Ethyl alcohol diminishes the adsorption only in cases where the ratio of earth used is insufficient for complete removal of quinine or of methylene blue.

The presence of quite large amounts of cane sugar was found to exert no retarding influence upon the adsorption of quinine bisulphate by fuller's earth.

In conclusion it appears that the adsorptive power of fuller's earth is exerted particularly towards certain compounds, characterized by distinct basicity and that, in the case of salts, only the base unites with the fuller's earth. No marked selectivity was found in the case of the two compounds forming the basis of the present experiments. The amount adsorbed in a given time is a function of ratio of earth to adsorbable material and, except with insufficient earth for complete adsorption, is independent of dilution, acidity or presence of non-adsorbable neutral material. (From the *Journal of the American Chemical Society,* January, 1918.)

Iodine Test for Hydrochloric Acid in Gastric Juice.—Scheltema remarks that the tests in vogue for this purpose allow some guesswork as to the findings. Titration with iodine is simpler and more reliable. When hydriodic acid is added to iodic acid, they act on each other with the result that water and iodine are formed. The equation is $HIO_3 + 5HI = 3H_2O + 3I_2$. This reaction can

serve as a sensitive reagent for hydrogen ions. The quantity of iodine separated out can be determined with sodium thiosulphate. To 10 Cc. of filtered gastric juice are added 5 Cc. of a 5 per cent. solution of potassium or sodium iodate, and then a crystal of potassium iodide or sodium iodide. Iodine separates out at once, as is evident from the dark coloration. Then 10 Cc. of tenth-normal solution of sodium thiosulphate are added, or more, with a pipet, until the fluid is decolored, growing limpid again. Then a little starch solution is added, and titrated with a tenth-normal solution of iodine until a dark blue color appears.

The quantity of iodine which was released at first must be equal to the 10 Cc. minus the number of cubic centimeters of thiosulphate solution. The presence of acid phosphates and organic acids does not interfere with the reaction, as they do not act unless in concentrations above what are encountered in the gastric juice. The iodine test here described indicates only the amount of free hydrochloric acid; the bound acid does not seem to share in the reaction. By adding merely a solution of some iodate and a little potassium iodide or sorium iodide to gastric juice, if iodine separates out, we can be confident that there is free hydrochloric acid present. (Reprinted from *The Journal of the American Medical Association.*)

The Crystalline Compound Containing Iodine Which Occurs in the Thyroid.—E. C. Kendal has isolated a compound in crystalline form which contains 60 per cent. of iodine; its molecular weight is 586. Its constitution is not known, but it is neither diiodotyrosine, tetraiodohistidine, triiodoimidazol, iodized tryptophan nor iodized phenylalanine. In physiological action it is identical with thyroid tissue. (*Endocrinology,* 1, 153 (1917). *C. A.,* 11, 3314.)

Microchemical Reaction for Perchlorates.—The reagents employed are (1) a 1:100 aqueous solution of strychnine sulphate; (2) a 1:50 solution of brucine in 1 per cent. acetic acid; and (3) a 1:50 aqueous solution suspected to contain perchlorate, which should be present as an alkali salt, is placed on a glass microslide so that it forms a deep convex spheroid and is not spread out over the surface. Into this is plunged the point of a finely drawn out-glass stirrer, previously dipped in either of the above alkaloidal solutions. If a turbidity occurs almost at once, which happens when a moderate quantity of a perchlorate is present, the stirrer is with-

drawn and the growth of crystals observed directly with low power without a coverglass; then afterwards, with a higher magnification under a cover. If no immediate turbidity is observed, the tip of the stirrer is brought down to the surface of the slide and stirred against the glass in concentric circles with gentle friction. In a short time, a turbidity will appear if perchlorates are present, and in a couple of minutes or so characteristic crystals may be seen under the microscope. With strychnine sulphate there will be group needles evident with a 1:1,000 solution of perchlorate. With brucine acetate a 2 to 3:1,000 solution of perchlorate is requisite to obtain characteristic lozenge-shaped crystals. With morphine hydrochloride a 1:500 perchlorate solution is necessary to show the stellate groups of morphine perchlorate. These reactions are the corollary of the author's micro reactions for alkaloids with sodium perchlorate reagent. (G. Deniges, *Annales Chim. Analyt.*, 1917, 22, 127, from *The Pharmaceutical Journal and Pharmacist.*)

Estimation of Silver in Organic Compounds.—The advantages of the cyanid-sulphide method are pointed out. 0.3 of the organic compound are dissolved in N/4 sodium cyanide solution, of which two or three drops are added in excess. The solution is warmed and, as soon as the solid has dissolved, 10 mils of N/1 sodium hydroxid solution are added, and the solution diluted to 300 mils. 25 mils of N/4 sodium sulphide solution in excess of the theoretical amount required for the precipitation of the silver are added slowly with stirring, and the solution heated to 60° C. and stirred until the precipitate has coagulated. The precipitate is then filtered off on a Gooch crucible, washed with water until free from soluble sulphide, then with alcohol and ether, and dried at 100° to 110° C. for half an hour. The excess of sodium sulphide mentioned makes certain the precipitation of all but 0.05 Mgrm. of silver. It is said by the authors of this paper that in a number of instances in which this method was used most excellent results were obtained. (*J. Amer. Chem. Soc.*, 1917, 39, 2074–2078, through *The Analyst*, Dec., 1917, page 400.)

J. K. T.

A Delicate Reaction for Hydrogen Peroxide.—It has been shown that tartaric acid in the presence of a ferrous salt added to hydrogen peroxide, and the addition of a caustic alkali, gives rise

to the formation of a violet coloration, due to the production of a ferric compound of dioxytartaric acid. Investigation by Deniges revealed that while this reaction was unsatisfactory for the detection of tartaric acid, it was, under certain conditions, satisfactory for revealing quite minute traces of hydrogen peroxide. Experimentation showed that the following test could be relied on: Two mils of a 5 per cent. solution of tartaric acid and one or two drops of ferrous ammonium sulphate of the same strength are placed in a test-tube, and, after shaking, one or two drops of hydrogen peroxide are added; when the hydrogen peroxide is very much diluted, as much as two mils of it may be added. After agitation and making alkaline with sodium hydroxide, a violet coloration is formed in the presence of as little as 0.04 to 0.05 of a milligram of oyxgen. (*Ann. Chim. Anal.*, 1917, 22, 193, through *The Analyst*, Dec., 1917, page 403.)

J. K. T.

TEST FOR NITRATES.—This test is carried out by adding to the suspected nitrate a crystal of resorcinol and a little brucine, covering the whole with a few drops of concentrated sulphuric acid. In a few minutes a deep blue coloration develops around the crystal of resorcinol and gradually diffuses throughout the whole of the acid. On dilution with water the color disappears, but a greenish-blue precipitate is formed.

The above test is also a ready means of distinguishing a nitrate in the presence of bromides and iodides. Nitrites also respond to this test.

J. K. T.

COLORIMETRIC METHODS FOR THE ESTIMATION OF VERY SMALL QUANTITIES OF MORPHINE.

I. GEORGES AND GASCARD'S IODIC ACID METHOD.—The authors employ a modification of this method. Instead of using a Duboscq colorimeter, they prepare a scale of colors by diluting a faintly acid solution of morphine in about N/10-hydrochloric acid to a concentration of 1 in 1,000 and then prepare from this a series of solutions of concentrations down to 1 in 10,000. Equal volumes (10 Cc.) of these solutions are treated with 5 Cc. of 5 per cent. iodic acid solution, and the yellow colorations are examined after about half a minute. The differences in color are more pronounced in the more dilute solutions. Whilst morphine can be thus detected at a con-

centration of 1 in 12,500, quantitative observations can only be made at concentrations between 1 in 1,500 and 1 in 5,500. The method is rendered more sensitive if 1 Cc. of 10 per cent. aqueous ammonia is added about five minutes after the addition of the iodic acid. Morphine can thus be detected at a concentration of 1 in 18,500 and estimated at concentrations between 1 in 5,000 and 1 in 16,500.

II. Estimation with Marquis's Reagent.—One Cc. of the morphine solutions prepared as above is evaporated in a small basin, the residue is treated with 1 Cc. of Marquis's reagent (2–3 drops of 40 per cent. formaldehyde solution, 3 Cc. of conc. sulphuric acid), and the violet solution is washed into the comparison tube with 4 Cc. of sulphuric acid. The colors are examined by transmitted light, since in reflected light an actual color change from blue to bluish-brown renders the comparison untrustworthy. Morphine can thus be estimated at concentrations between 1 in 1,400 and 1 in 14,000, and, the dilution with the sulphuric acid being omitted, can be detected at a concentration of 1 in 25,000.

Two samples of ripe poppy capsules examined by these methods were found to contain 0.017 and 0.068 per cent. of morphine respectively; in neither case did the seeds contain morphine. (From the *Journal of The Society of Chemical Industry.*)

Determination of Shells in Cocoa.—A method for the detection of shells in cocoa is described by Wasicky and Wimmer (N. Nahr Genussm., 30, 25–7, 1915). This method is based upon the difference in appearance between shell and nib tissue when viewed through a microscope by ultra-violet light. The proper light is best obtained by means of a carbon-iron arc lamp, the light before reaching the mount being passed through a Wood-Lehman filter (two blue Uviol glass cells, one filled with 1:2,000 nitrosodimethylanaline, and the other with concentrated copper sulphate solution. The color of the shell tissues when seen by this light is buff or brown, the mucilage cells being almost colorless or a light yellowish green. The nib tissues appear in various shades of blue-violet. The details of the method are as follows: Treat ten milligrams of the powder with ten cubic centimeters of alcohol-glycerol mixture (equal parts of each) and allow to stand for one hour. Centrifuge, pour off the liquid layer and add one cubic centimeter of

borax-glycerol solution (1 gram borax, 15 grams glycerol) to the solid residue. Mix thoroughly and place one drop upon a Hartwich-Wichmann counting cell. View through a microscope by means of ultra-violet light and count the number of shell particles visible over a given area. The per cent. of shells present can be ascertained by counting the shell particles in mounts of known composition prepared in the same way and comparing with the count of the unknown. The samples employed for comparison must have about the same degree of fineness. (From *The Chemical Engineer.*)

MEDICAL AND PHARMACEUTICAL.

PARAFFIN TREATMENT OF BURNS.—Various preparations of paraffin have been made under Hull's direction, containing acriflavine, brilliant green, chloramin-T, etc., dissolved in the paraffin base. These preparations have been given a very extensive trial. Another direction in which the new antiseptics have been given scope for improvements, has been the treatment of the burn by an antiseptic before the application of the paraffin. The results following this modification have been so satisfactory that Hull adopted it as a routine method. The method of application of the paraffin base is the same in all cases. The burn is first of all washed with physiologic sodium chloride solution or 1 in 1,000 acriflavine solution on gauze. A layer of paraffin is painted over the burn. The paraffin is applied at a temperature of about 55 to 60° C. A thin layer of wool is placed over the first layer of paraffin and a second layer of paraffin at the same temperature is painted over the wool. A dressing of wool and bandage is applied over the paraffin dressing. The dressing is changed every twenty-four hours. The addition of antiseptics to the paraffin preparation gave better results than preparations without antiseptics. The first antiseptic to be extensively used was eucalyptus oil, which, in conjunction with betanaphthol, is still used in No. 7 paraffin. Scarlet red paraffin has given satisfactory results in general use. It accelerates healing. Flavine paraffin has given satisfactory results. Paraffin preparations of brilliant green and chloramin-T have not been satisfactory from a pharmaceutical point of view, the antiseptics being difficult to incorporate in the paraffin.—From the *British Medical Journal,* reprinted from *The Journal of the American Medical Association.*

CHLORAMINE SURGICAL POWDER.—An absorbent, antiseptic, slightly astringent surgical powder may be prepared from the following formula, which is the advertised composition of "chlorazene powder," an American specialty:

Chloramine-T	1	per cent.
Zinc stearate	10	" "
Sodium stearate	89	" "

From *The Prescriber.*

FIFTY CASES TREATED BY FLAVINE.—Since June, 1917, Bashford and his associates have investigated the clinical results of the application of flavine to war wounds. At the same time an attempt has been made to interpret these results with the help of histologic and bacteriologic methods. The flavine used has been for the most part "acriflavine" sent out by the Medical Research Committee, but latterly samples of proflavine from the same source were substituted. The results were substantially the same with both. On account of the experimental nature of the treatment, the cases were carefully arranged in a series of gradually increasing severity. The wounds, taken as a whole, were not of great gravity, and this fact was considered in estimating the value of the treatment. Almost all had been treated previously at the front by the Carrel-Dakin method within twenty-four hours of being wounded, and, in the majority of instances, very efficiently. No wounds involving the cavities of the head, chest, or abdomen were included. The patients reached the wards at periods varying from one to six days from the date of reception of the wound, and the flavine treatment was then substituted for that of Carrel-Dakin. It was carried on continuously until either the wound became ready for secondary suture, or until, after three weeks' treatment, it had definitely failed to attain the necessary standard for closure. In a few cases the treatment was stopped in the patient's interest before the three weeks had elapsed. Every attempt was made to eliminate the possibility of personal bias. In wounds treated by the Carrel-Dakin method it is the cocci which are usually the last to disappear from an infected wound surface. In those wounds treated by flavine the commonest type of organism to outlive others on the wound surface was a gram-negative bacillus.

This study showed, in brief, that a solution of 1:1,000, far from

being innocuous, produces very deleterious effects on the entire process of healing, killing successive layers of the reacting tissue element, including the essential vascular mechanism. The flavine treatment of wounds is associated with small formation of pus, slow epithelial ingrowth, delay in all the processes of repair, lingering of organisms on the wound surface, some diminution in the local and general reaction to infection. The only favorable feature has been that the patient is apparently protected in some way from the absorption of toxic products. Whether this is due to the disturbance of vascularity or to flavine rendering toxic products nontoxic has not been determined. The authors are convinced that the employment of flavine and other dyes as if they supplied royal roads to success must be regarded as retrograde steps.—(E. F. Bashford, J. N. J. Hartley and J. T. Morrison.—*British Medical Journal,* London, reprinted from *The Journal of the American Medical Association.*)

Solvent Action of Antiseptics.—As the erosive action of Dakin's solution is an important factor, experiments were conducted by Taylor and Austin to compare its solvent action with that of certain other chlorinated antiseptics. The solvent action of the various substances employed was tested by adding 50 Cc. of each solution to 5 Cc. of an emulsion of macerated liver tissue to a 100 Cc. bottle. Chloramin-T solutions, hypochlorite solutions, chlorinated oils and dichloramin-T were tested. From the results obtained by the authors considerable stress is laid on the relatively great solvent action of Dakin's hypochlorite solution as contrasted with the more recent and more stable chloramins of Dakin. It also seems probable that to its greater ability to dissolve necrotic tissue, plasma clot, and leukocytes it owes its chief claim to preference over the chloramins in the treatment of infected wounds. The results also show that the solvent action of Dakin's hypochlorite solution in the degree of alkalinity used clinically is due primarily to its hypochlorite content. The slight alkalinity of Dakin's solution, while in itself without solvent action, does, however, increase the effectiveness of the hypochlorite. Chloramin-T failed in these experiments to exhibit any solvent action not explicable as an effect of the alkalinity of the solution in which it was dissolved, and dichloramin-T was wholly without solvent action. The results of these experimental studies do not, therefore, support the clinical

observations of Dakin and his associates, who assert that the chlorine in dichloramin-T, as in the hypochlorites, has the power of dissolving dead tissues. In the degree of alkalinity used clinically, the solvent action of hypochlorite is absent below about 0.2 per cent. sodium hypochlorite concentration. None of the antiseptics studied had demonstrable solvent action on blood clot.—(*Journal of Experimental Medicine,* Baltimore, reprinted from *The Journal of the American Medical Association.*)

TEST OF DIGESTING POWER OF GASTRIC JUICE.—Ramond adds 5 Cc. of filtered gastric juice to 5 Cc. of a 3 per cent. solution of gelatin in a test tube at room temperature. Tubes 15 Mm. in diameter seem best adapted for the purpose. The gelatin is sterilized at a temperature not surpassing 100° C., and the tube should be kept strictly vertical. He usually adds 2 Cg. of thymol on top of the gastric juice. A ring forms in the gelatin below the surface and makes its way downward. This is the work of the acid in the gastric juice. At the same time the surface of the gelatin grows lower and lower, but much more slowly. The progress of this digesting away of the gelatin can be watched by a graduated scale on the tube or a paper behind it. The digestion proceeds normally about 2.5 Mm. in twenty-four hours. Several tubes are used for each gastric juice. The test is a simple and practical method of determining the digesting power and the acidity of a given gastric juice.—(*Bulletin de la Societe Medicale des Hopitaux de Paris,* reprinted from *The Journal of the American Medical Association.*)

ANTAGONISM BETWEEN ATROPINE AND PHYSOSTIGMINE.—The conclusions from 225 tests made at the pharmacology institute of the University of Utrecht are that a given amount of atropine is able to neutralize the action of physostigmine in the proportions of 1 to 1,500 up to 1 to 1,500,000. From *Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam,* by G. den Besten and A. Sluyters—p. 1137, reprinted from *The Journal of the American Medical Association.*

COMMERCIAL AND TRADE INTEREST.

PATENT MEDICINE SITUATION.—Street reviews the operation of the Federal Food and Drugs Act and the Sherley amendment and directs attention to the requirements drawn up by the National

Vigilance Committee of the Associated Advertising Clubs of the World. In brief, these are as follows: (1) The medicine must be appropriate for the particular affection for which it is recommended and must not affect unfavorably the course of the disease. (2) The remedy must not be named or advertised in a way to conceal its proprietary character. (3) The remedy should be offered through the regular wholesale or retail channels of trade, and not directly to the purchaser from the manufacturer. (4) If the preparation contains alcohol, it must be sufficiently medicated to prevent its use as an alcoholic beverage, and the proportion of alcohol should be no greater than that needed to hold permanently in solution the essential active ingredients of the preparation. (5) If the preparation is one which may occasion injury through misuse, proper warning against such use must be given on the label. (8) The preparation must not be intended for use as an abortifacient nor for any other immoral or illegal purpose, nor must it be advertised directly or indirectly for such a purpose. (9) The preparation must not be advertised or recommended, directly or by inference, as a cure for the diseases or conditions generally recognized as incurable by the simple administration of drugs, or for the cure of contagious diseases or those sufficiently acute to require skilled treatment. (10) The preparation must be in strict conformance with the Sherley Amendment. (11) Advertising not accompanying the package shall conform substantially to the statements on the label, carton or accompanying circular as to origin, composition, character and curative value.—(J. P. Street, New Haven, Conn.—From *Current Medical Literature,* reprinted from *The Journal of the American Medical Association.*)

Mustard-Seed Production in Russia.—An increased demand for mustard-seed oil has resulted in a 25 per cent. increase in the acreage under mustard seed in Russia in the current agricultural year. The first statistics on this crop were gathered in a special census in 1916 and showed an acreage of 39,588 dessiatines (106,876 acres). In 1917, 133,700 acres were under cultivation. As the average yield of mustard seed per dessiatine is 50 poods (approximately 1,800 pounds), the production in 1916 was about 35,700 tons and in 1917 about 44,700 tons.

It is difficult to give an exact figure for the amounts of mustard seed exported from Russia because in the customs reports the seed

is included under the heading "other oil seeds." In 1915, 251.4 tons of seeds under this general heading were exported from Russia, and in 1916, 631 tons. According to the general data available, about 40 per cent. of the seed under this heading is mustard seed, giving an export figure for 1915 of about 100 tons and for 1916 of 252 tons. As the exports of mustard seed are not listed as such, it is impossible to list the ports of export or the destinations of the shipments.

About 70 per cent. of the crop of mustard seed is taken for mustard-seed oil production; about 10 per cent. goes for the production of ethereal oil; 19 per cent. is used in the manufacture of mustard (*Farina sinapis*); and the remaining 1 per cent. is sold by pharmacists under the name of mustard seed (*Semina sinapis*). (From *Commerce Reports.*)

JAPAN PEPPERMINT CULTIVATION.—We hear, says the *Monthly Trade Journal,* that steps will soon be taken at Hokkaido, where the chief peppermint cultivation of Japan is carried on, to systematize the cultivation of the planting and the manufacture of menthol. In the past, the sun-drying process especially has left much to be desired and, while the peppermint in the shape of crude oil has so far been shipped to Yokohama and Kobe, where it is distilled in the factories, it is now proposed to erect factories in the chief farming districts on a coöperative basis.

Peppermint oil derived from the residue of oil after being properly refined is finding every year a larger demand abroad. Before the war the largest customer of Japanese menthol crystal was Germany, while to-day America is taking at least 88 per cent. of the total output. The average price has been between $1 and $1.50 per lb., while several factories at the end of 1916 sent circulars to their chief customers announcing that, owing to circumstances, prices were likely to go up during 1917. This did not happen owing to improved factory conditions. During 1916 about 525,000 lbs., valued at $1,031,250, were produced. (From *The Journal of Industrial and Engineering Chemistry.*)

GUTTA-PERCHA FROM THE SHEA BUTTER TREE.—A supplement to the official *Nigeria Gazette* publishes a note to the effect that a trade in what is known locally as gutta-percha—a substance prepared from the latex of the Shea butter tree—has sprung up during

the last two years in the province of Bornu. The method of collecting and preparing the product is given as follows: Small pieces of the bark are chipped out of the tree with a narrow native axe. The latex that slowly exudes from these cuts is scraped off, as it contains impurities such as dirt, bark, etc. It is then boiled until the impurities float to the top when they are removed. The latex then coagulates and in this form is known as gutta-percha. It is not advisable to tap trees of less girth than 30 inches. The Shea butter tree is abundant in many parts of the Northern Provinces, and especially so in Meko, Shaki and Oyo districts of the Southern Provinces and in Ilorin. When collecting this product, the tappers could with advantage collect the Shea nuts and thus help to stimulate the trade in Shea butter. (From *The Journal of Industrial and Engineering Chemistry.*)

CARDAMOM PRODUCTION IN SOUTH INDIA.—The American consulate at Madras has received a letter from the Director of Industries and Commerce at Bangalore, Mysore, stating that considerable quantities of cardamom seed were formerly exported from the Mysore State, but that because of the stoppage of export for the past two years the trade is almost at a standstill. The Director, therefore, requests to be informed if arrangements can be made for shipping about 2,000 tons of seeds to America, and if it is not possible to find space to ship a large quantity of seeds he desires to know the names of any firms in the United States which might be interested in purchasing cardamom oil or who are wholesale dealers in same. He states that he is prepared to offer samples of seeds or of oil and to quote prices f. o. b. Bombay or Madras. It is suggested that any firm interested should write direct to the Director of Industries, Mysore State, India. (From *Commerce Reports.*)

BOOK REVIEWS.

THE ACTION OF DRUGS.—A course of Elementary Lectures for Students of Pharmacy, by Torald Sollman, M.D., Professor of Pharmacology and Materia Medica in the School of Medicine of Western Reserve University, Cleveland, Ohio. Published by W. B. Saunders Company, Philadelphia.

Some idea of the character of the book can be obtained from

the author's preface. In speaking of the scope of the lectures, he refers to the long course of study necessary to enable a physician to prescribe intelligently, and says: "Any one who undertakes to treat disease with a lesser preparation faces serious legal complications, and even more grave moral responsibilities, ... Indeed it would be far better for the public, and even for the pharmacist himself, that the pharmacist should be entirely ignorant of medical actions, than that he should become possessed of the dangerous conceit that he is competent to advise or prescribe. "As a professional man, he can coöperate with the prescribing physician much better, if he has an intelligent understanding of the broad principles which guide treatment, of the objects which are to be accomplished, and of the means that are utilized. The pharmacist himself will be protected against many blunders in the exercise of his higher professional function, the compounding of prescriptions. He will be able to protect the public against the errors of others, as well as his own. He may by the exercise of tact put the physician under lasting obligations."

The arrangement of part of the book seems quite peculiar; following Corrosive Poisons, we have Astringents and then Antiseptics and Disinfectants. Following Uterine Drugs and Antispasmodics, we have Tonics, Alteratives and Expectorants, etc. To an outsider there does not seem to be a logical sequence in this arrangement, although some other chapters follow each other naturally.

The different articles treated of are handled in an intelligent and extremely interesting manner which makes the book good reading. The articles are at times extremely brief and unless the student has more basic knowledge than most pharmaceutical students have, will call for considerable explanation.

Dr. Sollman is quite a nihilist regarding the value of many drugs. Of phosphorus he says: "To administer the ordinary dose of phosphorus with the idea of nourishing nerve tissue has about as much sense as to take water in five-drop doses with a similar object, for nerve tissue contains considerable more water than it does phosphorus." Of camphor, "internally it is said to be a sort of popular cure-all. As used by the laity, its effects are probably imaginary." Of mineral waters he says: "Most if not all of the natural mineral waters are marketed under exaggerated or even

fraudulent claims, at least as to activity. Lithia water is a flagrant example. Government investigation has shown that the most popular lithium water contains no more lithium than does the water of the Potomac river, and that one could not get an effective dose of lithium by drowning himself in the water. Such waters are of course absolute frauds."

Of the digestants it is said: "The various compound digestive elixirs are devoid of digestive action." Of the uterine sedatives he says: "They are largely sold in the form of 'patent medicines' for 'female weakness'; but it is very doubtful whether they have any action beyond the pyschic effect of the contained alcohol."

Of tobacco it is said: "More serious is the occasional occurrence of blindness in inveterate excessive smokers." This statement of Dr. Sollman many smokers will consider an exaggeration, but we can verify it from our own knowledge. He emphasizes the value of 10 per cent. solutions of alcohol in phenol poisoning, afterwards washing out the stomach. "Of chemical antidotes only syrup of lime and potassium permanganate are of any value."

In speaking of headache powders containing acetanilide or acetphenetidin, "the danger lies in repeating the dose at short intervals; the adjuvants caffeine, ammonium carbonate, sodium carbonate do not diminish the danger."

Of liquid petrolatum he says: "The Russian is no better than the American." In the physiological testing of ergot, Dr. Sollman considers the cocks-comb method as preferable to the bood-pressure or uterine methods. Many more interesting excerpts might be quoted from this work.

C. B. Lowe, M.D.

Merulius in North America.

In *Annals of the Missouri Botanical Garden,* vol. xv, no. 4, for November, 1917, Edward A. Burt describes 42 species of the genus *Merulius* that are found in North America. Thirty-nine figures, for the most part of spores, accompany the descriptions, while 3 plates comprising 36 figures supplement the article. A key to the identification of the species is also given.

In surveying this excellent monograph one is delightfully impressed with the care observed by the writer in employing technical color terms found in conjunction with color plates in a standard

work on colors. Too frequently otherwise valuable contributions to the literature of art and science are impaired by inexactness on the part of the contributor in expressing the various color shades. Since there exist a number of works on color, each differing in extent and character of nomenclature, it is often difficult for one to decide upon the work to be followed. There should be little hesitancy, however, upon selecting for comparison and citation some one good color reference, for it permits the reader to find the exact color shade which the writer desires to impart to the character presented.

The species of *Merulius* are of great economic importance on account of the dry rot of timber produced by those which grow on wood. Since very little has been published in the United States concerning decay caused by many of our common species, this monograph, giving the names and descriptions of the species and the kinds of woods attacked by each, will doubtless prove extremely valuable alike to the mycologist, plant pathologist and those interested in the lumber industry.

HEBER W. YOUNGKEN.

TWO EXOTIC COMPOSITÆ IN NORTH AMERICA.

J. M. Greenman in *Annals of the Missouri Botanical Garden* for November, 1917, mentions and redescribes two foreign species, *Senecio canabinæfolius* Hook. & Arn. and *Erechtites arguta* DC., which have taken foothold on North American soil.

The first of these, *Senecio canabinæfolius,* was found on ballast at Hunter's Wharf, presumably at Pensacola, Florida, by Professor Charles Mohr early in the nineties, who referred to it as *Senecio* without indicating the species. Upon comparison this specimen as well as another in the National Herbarium at Washington with Hooker and Arnott's original description of *Senecio canabinæfolius,* a South American species growing near Buenos Aires, the writer concludes they agree in every detail. He describes the plant as follows: "A stout herb, glabrous throughout, or slightly white-tomentose on the under leaf surface; stem erect, 1 to 1.5 m high, branched, striate; leaves 3 to 10 cm. long, mostly deeply bi–tri-pinnatifid with few linear to linear-lanceolate divergent sharply dentate lateral divisions; inflorescence a terminal compound corymbose many-headed cyme; heads about 1 cm. high, radiate;

involucre campanulate, calyculate; bracts of the involucre linear-attenuate, 5 to 6 mm. long; ray-flowers 9 to 13, rays yellow; disk-flowers numerous, about 50; achenes hispidulous.—Florida: on ballast ground, Hunter's Wharf, Pensa cola."

The second, *Erechtites arguta* DC., is a pernicious weed indigenous to Australia and New Zealand which has recently appeared on the Pacific coast. Alike with the common "fireweed," *Erechtites hieracifolia,* which has become widespread throughout North America, it is possible that it too may eventually become widely distributed at least in the western portion of this country. The writer cites the following characteristics of this species: "A coarse herb; stems erect, 3 to 10 dm. high, leafy, striate, slightly floccose-tomentulose; leaves oblanceolate to lanceolate, 3 to 12 cm. long, .5 to 2.5 cm. broad, pinnately lobed to runcinate-pinnatifid, sharply and unequally dentate, at first arachnoid-tomentulose above, densely and more or less persistently white-tomentulose beneath; the lowermost leaves narrowed into a petiole; the main stem-leaves sessile and semi-amplexicaul; inflorescence a terminal many-headed corymbose cyme; heads small, 5 to 7 mm. high; involucre calyculate and tomentulose at the base, nearly or quite glabrous above: bracts of the involucre about 13, occasionally becoming dark brown or almost black in the dried state.—California: near Mendocino."

According to the writer it is most probable that this species has been introduced in connection with the extensive lumber trade between California, Australia and New Zealand since collections of it have been made in the vicinity of lumber camps.

HEBER W. YOUNGKEN.

ESSENTIALS OF VOLUMETRIC ANALYSIS. An introduction to the subject, adapted to the needs of Students of Pharmaceutical Chemistry. By Henry W. Schimpf, Ph.G., M.D., Professor of Analytical Chemistry in the Brooklyn College of Pharmacy. Third Edition, rewritten. xiii + 366 pages, 5¼ by 8. 61 figures. Cloth, $1.60 net. John Wiley and Sons, Inc., New York.

In the preface to the First Edition the author states that his "aim is to present the principles of this interesting and important subject in a form readily intelligible to students, and available for lecture-room and laboratory work," an object which he seems to

have realized very fully in the present edition. The subject matter is systematically arranged and treated concisely, yet with such a clarity of expression as to make it easy for the student to comprehend.

The first seven chapters of Part I deal with the general chemical principles underlying volumetric analysis, the significance and use of standard solutions, indicators and the ionic theories regarding their action, description of volumetric apparatus and its uses, together with methods for calculating results of analyses. The remaining three chapters treat, respectively, of analysis by neutralization, by precipitation, and by oxidation and reduction. In addition to working directions for the preparation of the necessary solutions, both of reagents and the substances to be analyzed, each of these chapters gives special directions for the analysis of a large number of individual substances, together with much other information, much of it arranged in tabular form.

Part II, comprising seven chapters, treats of the estimation of alkaloids, phenolic substances, sugars, formaldehyde, alcohol in alcoholic liquids, as well as of assay methods for vegetable drugs and their preparations, and technical methods for analyzing fats, oils and waxes.

Part III, comprising five chapters, treats of the gasometric analysis of nitrites, nitrates, hydrogen dioxide, insoluble carbonates, and urea (in urine).

An Appendix describes, more or less briefly, nineteen substances commonly used as indicators in analysis by neutralization, giving, in each case, the source, color in acid and alkaline solution, uses, limitations, and strength of solution ordinarily used.

The subject matter of the book, so far as it deals with official substances, is in conformity with that of the U. S. P., IX, and the term "mil" replaces the term "c.c." of previous editions.

Though primarily intended for the use of students in schools of pharmacy, the volume is one which is well worth a prominent place in the laboratory library of the pharmacist, or anyone else, who does anything at all in the way of quantitative analysis.

F. P. Stroup.

A Critical Revision of the Genus Eucalyptus. By J. H. Maiden, I.S.O., F.R.S., F.L.S., Government Botanist of New South Wales and Director of the Botanic Gardens, Sydney. Vol. IV,

Parts 2 and 3. Published by authority of the government of the state of New South Wales. The appearance of these two additional parts to this extensive study of the Eucalypti carries on this masterpiece of monographic study, which we have reviewed from time to time as the parts were published.

Part 2 of Vol. IV describes *E. Seeana* Maiden; *E. exserta* F.v.M.; *E. Parramattensis* C. Hall; *E. Blakelyi* n. sp.; *E. dealbata* A. Cun.; *E. Morrisii* R. T. Baker; *E. Howittiana* F.v.M.; with excellent plates exhibiting the characteristics of the leaves, flowers and fruit which are the most important botanical points for distinguishing the species.

Part 3 of this volume similarly considers and illustrates the following species: *E. rostrata* Schlechtendal; *E. rudis* Endlicher; *E. Dundasi* Maiden; *E. pachloma* Benth.

The style of treatment of the subjects under consideration is the same as in the preceding parts, ample consideration being given to description, affinities, uses, literature, etc.

With the parts now before us this valuable contribution completes the critical study of 171 species of the genus *Eucalyptus*.

G. M. B.

NEWS ITEMS AND PERSONAL NOTICES.

First Potash Permit.—Under a recent act, the Secretary of the Interior is authorized to issue permits for the exploration for potash. Each permit is to cover a tract of not more than 2,500 acres and to run for two years. If the exploration demonstrates the presence of potash in satisfactory quantity and quality, a license for one quarter of the land will be given to the person having the permit. Under this law, Secretary Lane has issued the first permit covering a tract of about 2,500 acres of alkaline marsh land in Inyo County, California, and exploring wells will be promptly sunk.

The American Fairchild Scholarship.—The first award of this scholarship has been made to Daniel Kollen, of New York City. The recipient was born in the city of Kishinef, Bessarabia, Russia, August 27, 1898. His father died when he was about eight years of age and in 1910 his family emigrated to the United States.

His preliminary education was obtained in the Russian schools

for about three years and continued in the public schools of New York, where he was graduated from the DeWitt Clinton High School in 1917. He has been employed in the drug store of his uncle in New York City. He has matriculated at the Brooklyn College of Pharmacy.

Henry S. Wellcome Presents a Motor Bacteriological Laboratory to the British Army Medical Department.—Mr. Henry S. Wellcome, who acquired his pharmaceutical education in the Philadelphia College of Pharmacy and who is well known as a member of the firm of Burroughs Wellcome & Co., London, and as the founder of The Wellcome Bureau of Scientific Research, recently presented to the British War Office a completely equipped motor bacteriological laboratory for service in the Army Medical Department.

The body of the car and its weatherproof extended annex form a total working space of 219 square feet. A complete bacteriological equipment is supplied in thirteen strongly made canteens, so arranged that the contents are easily accessible, but securely safeguarded against damage in transit and difficult conditions of transport. The equipment contains the necessary tables, incubators, microscopes, balances, autoclave, centrifuge, etc., and a water tank fitted with a suitable pump is erected on the roof of the car.

In addition to the apparatus named, the equipment includes hot chambers, Pasteur oven, microtome, ice chest for water samples, a complete electric lighting outfit and arrangement for animal cages. The arrangement for the numerous accessories has been ingeniously worked out so that everything is grouped and readily accessible.

The annex and the complete bacteriological outfit are so arranged that they can be readily assembled and securely packed on the accompanying three-ton chassis. The entire outfit can be assembled and packed for transport in about two hours.

Dr. Whelpley Completes Thirty Years of Editorial Work.—With the issue of the special January number of Meyer Brothers' *Druggist,* Dr. Henry M. Whelpley rounds out thirty years as the editor. It is always an inspiration to note the many activities of Dr. Whelpley and how systematically and successfully he performs each responsibility. It is our privilege, as well as an esteemed pleasure, to extend on this occasion our sincere congratulations and

best wishes to this editorial friend, who in addition fills so many other important duties in the pharmaceutic and scientific organizations and performs each with marked ability.

Dr. C. T. P. Fennel now Professor of Materia Medica.—Dr. Charles T. P. Fennel, for fifteen years a state chemist of Ohio and later professor of chemistry in the Cincinnati College of Pharmacy, has been elected to the chair of materia medica at the University of Cincinnati, made vacant by the decease of Dr. Julius Eichberg.

Hearing on the Edmonds Bill.—Hon S. Hubert Dent, Jr., Chairman of the Military Committee of the House of Representatives, has appointed Tuesday, March 19, 10.30 A.M., as the time for the Committee to hold a hearing on H.R. 5531, the bill introduced by Congressman George W. Edmonds to establish a Pharmaceutical Corps in the Army.

Pharmacy Students Called to the Colors.—Each month we note the call of more of the students of the Philadelphia College of Pharmacy to their country's service. Since the Christmas holidays over twenty members of the pharmacy classes have been called to serve in the army. At the last report the number of students and graduates of the P. C. P. in last year's classes, enlisted in the military and naval service had passed beyond the two hundred mark.